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BI-MONTHLY REPORT

OF



THE AGRICULTURAL DEPARTMENT

FOR

SEPTEMBER AND OCTOBER,

1864.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE  
1864



## BI-MONTHLY REPORT.

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DEPARTMENT OF AGRICULTURE,

*Washington, October, 1864.*

In submitting the present Bi-monthly Report to the public, the Commissioner of Agriculture directs attention to the fact that it contains tables of the leading crops of 1864, stated in bushels, &c., as well as the usual tables presenting a condensed summary of the returns of the correspondents of this Department, showing the amount of a still greater number of crops in *tenths*. The first of these tables also shows the amount of the crops of 1862 and 1863, in bushels, &c., as estimated heretofore by the Department. They are so arranged that a comparison between these years can be made of the crops of each of the loyal States.

The Commissioner deems it but justice, both to the public and to his correspondents, in publishing these tables, to set forth the manner in which they are compiled. Confidence in their general correctness is necessary to the purposes for which they are prepared, and that confidence can be obtained only in two ways—by that trial which subsequent commercial transactions create, and by a knowledge of the plan, care, and skill with which they are formed.

The plan itself has heretofore been fully stated. In nearly every county of the loyal States the Department has a chief correspondent, aided by from three to five assistants. Nearly all the former have now had an experience of about eighteen months, and many of the latter of from four to eight months. Nothing is clearer to the Commissioner than the necessity of such experience. His correspondents, too, are selected chiefly from those whose knowledge and associations are of the farm, and whose zeal is quickened by the interest they feel in their own pursuit. These are essential qualifications to those communicating information of the crops.

When the present system of reporting the condition of the crops from month to month was first tried, many returns had to be discarded, because of want of information in those who kindly made them. This was seen in the omission to answer many questions, and in letters accompanying the returns, in which the correspondents frankly stated that many of the answers were guesses only. But the knowledge and information necessary to a correct opinion were gradually obtained, and with them awoke a lively interest in the work in which they were engaged. There exists, consequently, no longer doubt, and in but few cases even hesitancy, and then only in peculiar cases.

But the final tables of the crops, showing their amount in bushels, &c., are not based on a *single* return of the correspondents, however well trained, and numerous as those of this Department are, but on *several*. Take as an example the wheat crop. In the fall, the amount sown, its growing condition, its injuries from the fly, or other cause, are ascertained. In March following, the

injury by freezing is learned ; its growing condition from that time until harvested is carefully reported to the Department ; when harvested, its supposed amount as compared with a previous year, its quality, the amount of the injuries it has received, and the causes of those injuries are likewise reported ; and, finally, after it is threshed, the amount is again reported. When the final tables are to be made, all these returns are compared, the large correspondence accompanying them is examined, and from all these tables are made up.

Here let me remark that my own long practical experience and observation in agriculture, for a period of over forty years, has given me to understand the wants of the agricultural interests of our country ; and hence the necessity for placing the facts and conditions of the crops before the farmers of the United States, that they may understand the true condition of the agricultural products of the various sections of the country, and govern themselves accordingly.

But, again : These tables are based upon clear and definite returns. The statements are not that such a crop is "larger," "usual," "average," "equal," "light," "good," "small," and so on, or given in fourths, or thirds, or halves, the lowest of which often mean, in our great American farming, millions of bushels, but the returns to this Department are stated in *tenths*, conveying precise, clear, definite ideas, and quantities so small that their fractions used in the summaries of the crops of each State represent such small quantities that an approximation to correctness is secured.

Nor is it of less importance to have as clear and definite a standard of comparison. The usual standard is an "average" crop. But what is an *average* crop is a question that would be answered very differently by correspondents. By reference to the questions of this Department it will be seen that they ask a comparison with crops of certain years, the amounts of which have been published by the Department. As soon as the Department can properly fix for each crop, in each State, the amount per acre, constituting an average or normal crop, it will do so, and then such standard will be more precise than even the one now used.

No people is more impatient to see results than those of the United States. This disposition of mind invites in reports of the amount of the crops to premature statements ; but knowing well the vicissitudes of the seasons, that favorable or unfavorable weather usually largely increases or diminishes a crop, this Department does not pretend to foretell, but simply to learn the state of the crops at that time, when ordinarily they are matured or harvested. To "hasten slowly" is a prudent maxim in every affair, but especially in matters of crop reporting in a climate of extremes like that of the United States. Its uncertainty is seen even in the tables of this report, based on information communicated as late as the first day of this month, for doubtless the severe frost of October 9th has injured the sorghum and buckwheat crops.

Whilst thus referring to the reliability of the information derived from the correspondents of the Department, because of their experience and the manifest interest they take in obtaining correct knowledge of the state of the crops, it is but justice to them to remind Congress that this information is communicated gratuitously, save in receiving copies of the reports of this Department, and a



portion of the seeds distributed. It is essential to them that there should be placed in their hands a copy of the unabridged census report on agriculture as soon as it is published, for only this one contains the crop returns of the census for each of the counties of the several States. And in no more useful hands could this report be placed, for they are of our most intelligent farmers, and superior to all others in having their minds imbued with a just appreciation of that statistical knowledge embraced in this census report, and in their duties as correspondents of this Department. The report, when placed in their hands, will not be found with the unused books upon the shelf, covered with dust, but living facts scattered abroad in their respective neighborhoods, and even returned to this seat of government in the more certain knowledge communicated by them to this Department.

Another topic to which the Commissioner asks the particular attention of the farmer is the article on drill and broadcast sowing. It will be found to embody the opinions and experience of many farmers on the question of the best mode of sowing wheat. It is only through agencies such as this Department has, that the wide-spread evils to which our agriculture is liable can be simultaneously noted and reported, and when accompanied with the remedies, which an experience not less wide suggests, they cannot but command the attention of all farmers.

A third subject embraced in the present report, of much interest now, will be found in the article on the state of the foreign grain markets and crops. The knowledge of the facts that France will not probably be able to supply the English markets with wheat and flour during the coming year, that much of the wheat of northern Europe is injured by wet weather, and that the hay, oats, and root crops of Great Britain are a greater failure than has been known to the present generation of English farmers, cannot but prove advantageous to our own agricultural community. The great scarcity of food for farm stock in Great Britain must create an active demand for American Indian corn, and our capability to supply it, at reasonable prices, is shown in the article referred to. Whilst the present crop of corn is less than that of 1862, yet the home demand upon it will be proportionably less, so that the surplus for exportation in 1865 will not be much below that for export in 1863.

Besides the usual statistical tables of exports of domestic produce, and of English imports of grain and textile material, this report contains a table of the number of immigrants to this country at New York during the months of July, August, and September. For this the Department is indebted to the courtesy of Mr. Draper, collector of the port of New York.

The mail communications between the seat of government and the Pacific States and Territories do not allow them to be placed in the tables with those of the Atlantic coast. Hence it is necessary to speak of them in a different way, and what information the Department has of their present season and crops has been given in this report. But it is to be regretted that the information sent is not more extensive and more regularly received.

ISAAC NEWTON, *Commissioner.*

## DRILL AND BROADCAST SOWING.

In the bi-monthly report for April and May will be found the returns of the correspondents of this Department of the injury to the wheat crop last winter from freezing, and the proportion of this loss between that sown by the drill and that broadcast. Accompanying these returns were many letters giving facts and opinions relative to these modes of sowing wheat. We now turn to these returns and letters for the purpose of making an examination of the facts, and deducing from them the lessons they teach.

1. *The returns.*—From these, as stated in the bi-monthly report for April and May, the loss may be estimated to the whole crop from freezing, and what portions of it fall upon the drilled and the broadcast sowing.

The wheat crop of 1863 was estimated at 191,068,239 bushels. The Department has as yet no facts from which it can determine what amount of this was winter wheat and what spring wheat. But looking to the territory where each is grown, we believe it is not far out of the way to suppose that one-third is of the latter.

The amount of winter wheat, then, would be, for last year, 127,378,826 bushels. Supposing that the crop as sown last fall would have yielded an amount equal to the crop of 1863, then, according to the returns,  $2\frac{2}{3}$  tenths, or 24 per cent., of the winter wheat was destroyed by freezing—this is equal to 30,570,918 bushels. Of this *two* parts were of that sown by the drill, and *three* parts of that sown broadcast. Hence of the entire loss 12,228,366 bushels were of the drill sown, and 18,342,549 bushels of that sown broadcast—a difference of 6,114,183 bushels.

The general average price of wheat in November, 1863, as returned by the correspondents of the Department, was \$1 14 per bushel. The loss, therefore, from broadcast sowing over that of drill sowing was \$7,260,592.

2. *The letters.*—Below we give the facts and opinions stated in many letters, especially from those of the western States, where the injury was very great. As the eastern States suffered but little from cold, the relative merits of the modes of sowing under consideration could not be tested by them, hence no extracts from their correspondence are given.

## ILLINOIS.

*Perry county.*—"The damage to drilled wheat is *one-tenth* less this year than it commonly is. The damage to that sown broadcast is *two-tenths* greater than it has commonly been. The damage to broadcast sown by freezing out is commonly two or three times as great as it is to the drilled."

*Winnebago county.*—"The portions of winter wheat remaining under the fences look as well as an average. The crop as a whole is almost a total failure, probably less than one-tenth of what was reasonably anticipated last fall. There appears to be no difference between broadcast sowing and drilling; it is all killed alike."

*Bond county.*—"Of wheat there will be about two-thirds of a crop. Drilled is far superior to the broadcast."

*Ogle county.*—"Winter wheat is a failure, except where the heavy snow-drifts lay most of the time. Experience shows conclusively that the drill is the only mode of successfully growing winter wheat in this county."

*DeKalb county.*—"Winter wheat lately doing well; broadcast injured most, and drilled least."

*Menard county.*—"Last winter fully demonstrated the superiority of drilled over broadcast sowing in Illinois soil for winter wheat."

*St. Clair county.*—"In relation to the advantage of planting wheat with



drills, it is considered so important by our farmers in this county that you scarcely see a field of wheat sown broadcast. Last winter was so severe upon the broadcast that I do not believe a single farmer will attempt to sow wheat broadcast this fall."

*McDonough county.*—"As to the relative merits of sowing wheat broadcast or by drill, all I can say is that drilling has gone out of vogue very nearly in the last three years. We used to drill a good deal of our wheat, but of late drills are seldom seen, by which I infer that drilling has not been regarded with much favor."

*Jersey county.*—"It is only when stumps or corn-stubs are in the way that broadcast sowing is resorted to. Some of our best farmers harrow after the drill, some roll before and after, but the surest way is to have the ground rough enough to mellow down with the frost. I have tried all ways. One year I sowed half a bushel per acre, and harrowed after the drill, and reaped forty bushels per acre. Last year I rolled some after the drill, mashing all the ridges down; it made the poorest wheat I had. The ground alongside, not rolled after, but before the drill, made double the wheat. The theory amongst our farmers is to make the ground solid, leave the drill-ridges to stand, and sow from the 15th to 25th of September."

"As to broadcast and drill sowing for wheat which you speak of, the former is by far the most successful; but to do neither is the most profitable in central Illinois, where twelve bushels of wheat are above the average yield per acre."

#### INDIANA.

*Ripley county.*—"The wheat was very much winter-killed, but the warm wet weather has revived it very much; and as regards the difference in drilled wheat and that sown broadcast as to winter-killing, there has not been much drilled in this county, but it shows the superiority of drilling."

*Allen county.*—"In regard to the difference in winter wheat drilled in or sown broadcast, it is largely in favor of the drilling where the ground is properly prepared. It should be thoroughly pulverized, either by harrowing or rolling, or both if necessary. When the ground is rough and cloddy, it is the experience of our farmers that wheat does better sown broadcast. Few of our farmers in this vicinity realize the great advantages to be derived from the thorough preparation of the soil before planting. To the majority of them under-draining, subsoiling, rolling, and a regular system of cropping and manuring are subjects that receive no attention in preparing for seeding, and the result is always too plainly manifested in short and inferior crops at harvest."

*Parke county.*—"There is more difference this season than ever before between wheat sown with the drill and broadcast. The drilled is decidedly the best; it will yield one-third more to the acre than the broadcast."

*Howard county.*—"Our wheat crops are better than ever known since our county has been settled. Drilled wheat is the best, and in the coming year there will be little, if any, sown broadcast."

*Huntington county.*—"In my report for April and May I felt authorized to say, in reference to wheat sown by drill and broadcast, that that sown by the drill was not apparently injured, while that sown by the other method was seriously. Since that time quite an improvement was made in the appearance of that sown broadcast, and, had we not suffered so severely from drought, our crop would have been above an average. One of our most careful and judicious farmers states that while his drilled wheat seemed to stand the winter better than that sown broadcast, still at harvest this last was the best in every particular. *His broadcast did not suffer much from freezing.* So, too, some others of our observing farmers hold the opinion that if as much care be taken in the prepara-

tion of the soil for broadcast sowing as *must* be done for the drill, there would be no advantage in drilling; perhaps the advantage would be the other way."

*Whitney county*.—"We suppose wheat much better drilled than sown broadcast, and I am inclined to the opinion that it is best to have it drilled north and south, as our winds mostly come from the west. It saves the snow from being blown away from the roots of the wheat, and the whole field will not sweep as clean of snow as where the drilling is east and west."

*Henry county*.—"Harvesting of the wheat crop has still further shown the advantages of drill over broadcast sowing. I think the difference may be estimated at the lowest at *one-tenth* in favor of drilling. *Early*-sowed wheat is also much the best, say *one to two tenths*."

#### OHIO.

*Marion county*.—"Although on the subject of drilled and broadcast sown winter wheat, I have made considerable inquiry, I have hesitated to make a positive statement. I found on one farm near town that 10 acres were sown broadcast by one person, and 12 acres were drilled in by another, and there was no appreciable difference in the character of the soil—that is, there was about the same proportion of black and clay soil. Now upon the 12 acres of drilled wheat there is three times as much standing in good condition as upon the 10 acres. Going about half a mile further east I found a field of, say 30 acres of wheat, which had been drilled in, but which was such an utter failure that oats have been drilled in upon the field this spring. This field was of a cold, wet, clay soil, perhaps as unfavorable for wheat as could be selected. Another farmer stated that after a crop of flax he had suffered a field to lie in fallow last summer, and in the fall ploughed a part of it; finding it very mellow, he put in his wheat by drill, both that which he had ploughed and that which he had not. This spring it is in excellent condition, all parts being about the same. He had sown the same field in wheat several times before, and on a certain portion of it (perhaps somewhat wet) he had never before raised any wheat, but this year (drilled in) there is no appreciable difference in the whole. I have asked the question of a great number of farmers as to the comparative value of drilled and sown wheat, and the almost uniform answer is in favor of the former—1st, because it is evenly sown; 2d, because it is a protection against the effects of frost. Many, indeed, say they cannot prove this by their own experience, and yet they are decided in their own opinion; only one farmer I met with said he had tried both, and was positively in favor of sowing broadcast, even having in view the effects of the frost."

Two months after, this excellent correspondent thus writes: "The crop of winter wheat last year was very deficient, and consequently, although that of this year was seriously injured, it was still better than the former. Continued inquiries respecting the comparative value of drilled and sowed wheat show the decided advantages of the former. One farmer reports, for example, that he has two pieces, side by side, of like soil, and the drilled portion was injured by frost, say  $\frac{1}{10}$ , the sown  $\frac{5}{10}$ . He says that many in his neighborhood ploughed up their sowed fields; one field, sowed late in August, produced a fine crop."

*Clermont county*.—"In my report you will see that I have given 8, or 2-tenths, as the average amount destroyed by winter (cold) of that sown by drill; and 6, or 4-tenths, of that sown broadcast. I do not know but what the difference in favor of the drill is greater."

*Van Wert county*.—"Early and drilled wheat decidedly best."

*Hocking county*.—"The winter wheat in this county was damaged mostly by the severe winter and winds; where it is protected from the sharp winds it is good, but where it was exposed it amounts to very little. Some of our farmers ploughed in their wheat, and such is better than that harrowed in."

*Warren county.*—"There is very little difference in the appearance of the drilled and broadcast; what there is is in favor of the former."

*Loraine county.*—"The drilled wheat suffered least; mine was drilled, and I have over two-thirds of a crop, whilst my neighbors' is totally destroyed."

*Knox county.*—"The difference in favor of drilling is not so apparent as usual. Protection from the piercing wind, on the first of January last, had a more favorable influence on the wheat crop than any other cause. Take our county over, and we will scarcely have more than our seed. When I found that my wheat was killed, as the next best thing I procured spring wheat, and at the proper time put it in with a drill running crosswise of the last fall's drilling, thus leaving the old to grow with the new. I have just finished cutting a No. 1 crop of wheat; I cannot tell how much per acre, but the crop is a good one in quantity and quality. If that course had been generally pursued, the advantage to the country would have been immense."

*Defiance county.*—"Drilled wheat has done very well, and shows its good effects this season. Late-sowed wheat is not so good as usual. I think there are at least  $\frac{5}{10}$  difference, and in favor of drilled wheat."

#### IOWA.

*Des Moines county.*—"The winter wheat was frozen in the ground; therefore no difference between that sown broadcast and by the drill."

*Dallas county.*—"Drill sowing is decidedly the best, and rolling the ground heavily afterwards would have been an effectual remedy this season. Fields treated thus suffered but little." [We suppose our correspondent speaks of rolling in the spring, and not immediately after the drilling.]

*Floyd county.*—"One of my assistants says he had some experience in drilling spring grain. In an ordinary season good broadcast sowing is equally good as drilling; but in a dry season the drill is the best."

#### MICHIGAN.

*St. Joseph county.*—"The grain-drill has not been used extensively in this county, but when used properly the results show a decided advantage in that mode of planting."

*Wayne county.*—"The drilled wheat suffered equally with the broadcast, save where drilled north and south, when, in some places, where the ruts were deep, it was sheltered from the sweeping west wind. Drilling has some advantages and also some disadvantages. Its advantages are, it is less liable to upheaval, and on loose soils to have the earth blown or washed away from its roots. Its disadvantages are, that in wet seasons it is liable to be submerged in the ruts on undrained soils. When the ground is frozen, and a partial thaw occurs, the ruts are filled with water, and frequently freeze over immediately on the cessation of the thaw, and the wheat is frequently smothered. As far as my experience goes, drilling is, on some soils and in certain seasons, an advantage; in others, an injury. I found also the sweeping wind, rather than the intensity of the frost, has destroyed the wheat. I find northeastern exposures, where it must have been equally cold with other parts of the field, escaped by having the wind arrested by the fences; that sowed by the drill, being in trenches, suffered but little. I sowed last fall four hundred acres, both with drill and hand. The hand-sowing is not worth cutting, whilst the drilled is fair. The same is the case as far as my observation extends."

*Simpson county.*—"Wheat that was sown on land cultivated last year in tobacco is in more than an average growing condition. That upon land cultivated in Indian corn less than an average."



## MARYLAND.

*Cecil county.*—"It is difficult to compare wheat sown by drill and broadcast, as nearly all is sown wholly by the one or the other method. Mine was sown broadcast, and it was considerably injured. A neighbor sowed by drill, and his is also injured. After several experiments, he is rather unfavorable to drilling. He thinks too much open space is left unoccupied between the drills. A part of his ground he drilled both ways, putting on, as he thinks, an equal quantity of seed, or nearly so, in both portions. That drilled both ways has much the best appearance. My own opinion is, that drilled wheat is less injured than broadcast. A few years ago a neighbor, an Englishman, ribbed a part of his ground in ploughing the second time with a right-hand plough, running each succeeding furrow at the right-hand of the preceding one. He then broadcasted the whole and harrowed. That on the ribbed portion came up as if drilled only a little wider a-part, and was by far the best when harvested. I tried the same method once, and drilled alongside of it. I could see no very material difference in the yield."

*Carroll county.*—"The *early*-sown wheat is very good, but the late-sown is below the average. When will the farmers learn wisdom?"

## NEW JERSEY.

"The reports from this State, and others in the east, show that the winter was favorable, hence no test could be well made of the relative merits of drill and broadcast sowing. In one county of this State, where much wet soil prevails, the broadcast was thought to be injured one-fourth, and the drilled uninjured; and I also find that new land has escaped when equally exposed. Can you give us the philosophy of this?"

## MISSOURI.

*Crawford county.*—"There has been hardly the usual amount of fall wheat sown in this section on account of the drought last fall, which lasted till October 1. Having been sowed late, and got a poor start, a large amount has been frozen out, which will cause our crop in this section to be poor. Spring wheat is not sown here yet; I am satisfied it would do well."

*St. Louis county.*—"There is unfortunately far too little drilling in of wheat in this neighborhood, so but little can be said by way of comparison, but it is all in favor of the use of the drill."

## KENTUCKY.

*Mercer county.*—"The past winter has demonstrated to me beyond a doubt the advantage of the drilled over the broadcast sowing of wheat. Owing to the system of labor in Kentucky, and the inability of the negro generally to handle machinery, but little of it has been used until within the last few years, in either sowing or harvesting grain. But from my observation in other States of the present growing crop of wheat, the difference in the mode of sowing is marked, and altogether favorable to the drill. Also, I am satisfied that *early* sowing and *deep* ploughing are the best, as attested by the present growing crop."

*Garrard county.*—"With regard to the value of the drill over broadcast sowing, I will remark that the drill is an innovation on the "institution," and of course very cautiously introduced; requiring more intelligence to work them than brute force, therefore not extensively used. But I think the difference fully as great as I have put it. In that sown broadcast, I think the yield will be less than a third of a crop, while that drilled will be very nearly a full crop—all taken together, a little over half a crop."

*Oldham county.*—"I have sown with the drill several years and have never had a failure, while broadcast this year nearly all froze out in February and March, or, more properly speaking, froze in the ground. The land was very dry in February, when the extreme cold weather came, which froze the wheat to death, of most of the broadcast sowing, leaving the roots of the wheat in the ground, but entirely dry.

## PENNSYLVANIA.

*Armstrong county.*—"Winter wheat not half a crop; the drilled is much the best—has stood the freeze much better than the broadcast."

*Lekigh county.*—"Since 1850 the drill has been in general use in this county. At present two-thirds of the farmers use it, having found it a safeguard against freezing out, and a saving of seed."

*Westmoreland county.*—"The past winter has, I think, thoroughly tested the question whether drilling is superior to broadcast sowing for fall grain. In this county all have suffered equally. On my own farm I drilled about the half of a ten-acre lot, and sowed broadcast the remainder. At the present time I can see no difference, each portion being badly injured by the severe weather of the past winter. But in ordinary seasons drilling may be advantageous; still I think it is an open question, to be decided, not so much by the *mode* of sowing, as by the previous preparation of the soil."

*Montgomery county.*—"We have had a very favorable and wet spring. Wheat, though frozen out considerably, looks well; that sown by the drill was not much injured, but that sown broadcast was, at least,  $\frac{3}{10}$  frozen out."

## NEW YORK.

*Chemung county.*—"The present winter has levelled all distinctions in effect of drill and broadcast sowing. There is no difference in a field of mine, one-half drilled and one-half broadcast. The wheat was not thrown out, but *dried* to death. Some fields look better in sheltered situations as a wood or hill on the north-west side, also by or near fences."

*Chautauqua county.*—"Wheat that was drilled in last fall looks much better now than that sown broadcast. Drilled wheat stands freezing and heaving out much better than broadcast sowing."

*Ontario county.*—"As we have got through harvest, I will give you the information you ask relative to drilled and broadcast-sown wheat. We had sixteen acres of wheat drilled, which is estimated at thirty bushels per acre, whilst the next field sown broadcast is estimated at but ten bushels per acre. Both fields were cultivated in the best manner, are tile-drained, and were well manured. We drill *two* bushels of seed per acre, and sow *three* broadcast. So you will perceive that there is a great saving of seed by drilling. It also, by leaving the ground in ridges, protects the plant from the cold winter winds, and in the spring, as the earth thaws out, it crumbles and falls around the roots. Hence the roots are not injured by alternate thawing and freezing, as are those of the broadcast sowing."

## · COMMENTS.

1. The most prominent thing that strikes the reader of these extracts is their almost unanimous testimony for the superior excellence of drill sowing. Even where broadcast sowing is regarded as equal if the same care was observed in the preparation of the soil, yet, if it would in all such cases be equal to the drilled, there still remains the fact that broadcast sowing leads to insufficient preparation, and drill sowing to its observance. Add to this reason the fact stated by the last correspondent, that broadcast sowing requires a third more seed, and it must be conceded that this mode should be entirely abandoned. But

other and stronger reasons for the use of the drill will be given in their proper place.

2. Several correspondents refer to the fact that the freezing of last winter of the wheat roots was not of the usual character generally, the freezing *out* as it is called, but was the freezing *in*, that is, the roots were destroyed whilst yet *in* the ground, and had not been first heaved out. It is proper, therefore, that these differences should be clearly understood, so that the relative advantages of drilled and broadcast sowing may be more certainly seen.

Freezing *out* is caused by the ground being first saturated or soaked with water and then frozen deeply. When the water is changed to ice it expands, and with this enlargement the soil is heaved up. If the soil be examined when in this state, it will be found full of ice in small divisions, giving it the appearance of honey-comb. If this ice is suddenly thawed, and the water and the ground sink down together, no injury is done to the roots, unless the cold is very intense. But if, as is often the case, the thawing is gradual during the day, and followed by cold, freezing nights, then the injury is great, and is occasioned in this manner: as the ice is thawed on the top, the water runs down into low places, and is evaporated quickly, for the cool northwest or western winds are so very dry, and so highly and positively electrified, that their capacity for absorbing moisture is much greater than that of the warm winds of summer. Every housewife, when hanging out the washed clothes to freeze dry, gives evidence of this fact. Soon the top soil is dried, it sinks down as the ice leaves it, into a dry and loose condition. But the roots of the wheat cannot sink down with them, because their lower parts are held fast by the ice which remains about them unthawed. Thus gradually they are bared, and whilst so the night's freezing kills them. A few such upheavals and freezing destroy a large portion of the crop. Now, it is against this destruction that drilling is especially advantageous, for reasons that will be stated presently.

Freezing *in* results from the extreme intensity only of the cold. Beyond a certain degree of cold, winter wheat is as easily killed by it as oats, and spring wheat is at a lesser degree. Hence the necessity, in high latitudes, of the protection of the snow. Roots that are weak, from not having time to become strong, from late sowing, or from the soil being so poor that it does not afford them sufficient nutriment, have not that vitality which older or better grown roots have, and are therefore more easily killed. A correspondent asks why wheat sown on *new* soil stands the winter better? Because, being a rich soil, it has grown a more vigorous root, and also because new ground, being more porous, allows the water to pass through it more readily, so that freezing does not upheave it so much.

These facts explain several other things seen in the experience of the past winter. They show why the *late*-sown wheat was killed, although drilled in, and why the field sown broadcast in August produced so good a crop. Hence is seen, too, that to determine the relative advantages of drill and broadcast sowing, we should know the nature and condition of the soil, and the time of sowing; for whatever the excellencies of the drill may be, it cannot take the place of manures, or deep ploughing, or a thoroughly pulverized soil, or timely sowing. The field of 30 acres, referred to by our correspondent from Marion county, Ohio, was destroyed because the soil was not sufficiently rich to grow a root having a vitality sufficient to endure the intense cold of last winter, made more intense by the large quantities of water which were held by the tenacious character of the soil. If to these unfavorable conditions *late* sowing had to be added, who can rationally expect that the drill, whatever its excellencies, could overcome the combined power of such evils?

3. And here the conviction must force itself upon the mind of every reflecting reader how much American agriculture needs the aid of well-conducted, closely-observed, and long-continued experiments. Partially observed results



so often lead to erroneous conclusions that no satisfactory and certain progress can be made by their aid. Hence the fact that but few things connected with our agriculture have been determined. Most of them remain now, as they were a quarter of a century ago, unsettled questions, because results have been so imperfectly seen. But even by them some questions have been settled, though obscurely, and among these is the general conviction of the utility of drill-sowing, as is manifest from the above extracts of the correspondence of the Department.

Experiments should be made in every latitude, and hence this Department cannot make them. But in the establishment of the Industrial Colleges, under the donation of Congress, the future of our agriculture will not labor under the disadvantages of the past and present; but as the soil becomes more worn by our vast production, there will be found the means of determining the agencies of every result, and these, once clearly seen, can be controlled by an enlightened agricultural art.

4. In the absence of such experiments we must rely on general results, and not on individual cases, which are determined by unobserved incidents, and by inherent differences of two or more modes of cultivation. Thus as to drill and broadcast sowing, we must learn their peculiar differences, so that we may determine the results of each as modified by season, time, soil, manure, depth and number of ploughings, and the pulverization of the soil. The purposes of this article would be uncompleted if a brief examination of their peculiar differences was not made.

Drilling has two general objects in view—saving of seed, and such disposal of it as will best tend to the production of a perfect plant. Of the first, nothing more need be said than has already been. Of the second, everything is attained if the root is well grown in the fall, for such root resists freezing *out*; it has acquired sufficient vital power to resist freezing *in*; it pushes forward the spring growth of the plant to early maturity, thus avoiding rust, and overcoming the attacks of the fly, and it insures a large crop by sufficient stooling, and by better filling the grain. Essential to such results are, of course, a rich soil, properly prepared, and timely sowing; but these do not belong to the sowing, and therefore cannot now be properly considered, for its office simply is to place the seed in the ground. It has in view four things: to place it at the proper depth; to distribute it equally, so as to allow equal space to each plant; to give it protection during winter; and to allow spring cultivation. These will be briefly considered in the order stated.

1. *Proper depth of planting.*—Every observing farmer will admit that ordinarily the fall growth of wheat determines the success of the crop. Now, in a climate like that of the United States, where the dry Indian summer prevails from the first of October to the middle and end of November, it is of the last importance to place the seed at that depth where the roots will be shielded from the surface droughts, and can reach the uprising subsoil moisture. Drill-sowing places the seed about three inches below the surface of the drill furrow. As the roots grow, they pass beneath the drill ridges, thus increasing this depth from the surface. In very *dry seasons* this is of much advantage, but not material in moist ones. And to this fact, probably, we owe the different results stated by the correspondent from Jersey county, Illinois, from harrowing and rolling after the wheat was drilled in.

Broadcast sowing, especially if harrowed and not ploughed in, but barely covers a large portion of the seed. In this condition it is subjected to the influence of the Indian summer droughts, and forced to seek moisture in the dews and slight showers of this season. To learn what effects on the fall growth of the root these different depths of planting have, we need but examine the state of the roots in the spring. Having done this carefully, after a winter of very injurious freezing *out*, we can confidently declare what that state is.

The roots of the drilled wheat as they came from the stool of the plant were double the number of those from that sown broadcast. The latter were only half the length of the former; either without branches, or with very weak ones. But the drilled root branched once, often twice, strongly. Altogether the mass of roots from the drilled wheat was, in bulk and weight, more than double those from broadcast sowing.

The roots of the drilled wheat also curved downwards, and this clearly showed the source of their sap to be the uprising sub-soil moisture, for the roots of plants always turn in the direction from which their sap is derived. The roots of the wheat sown broadcast were in an almost horizontal direction, and this direction as clearly indicates their dependence on the surface moisture derived from dews and slight showers. As these in a dry fall are inadequate to the wants of the plant, its growth is checked, and winter finds it unable to endure the cold. The surface roots are soon laid bare, many entirely so, some still have a feeble hold by the ends of one or more of the roots, and there is scarcely a plant but can be raised up from the place of its growth, whilst the drilled-in wheat presents a plant firmly fixed and immovable.

2. To have an equal growth each plant should have an equal space in the soil. Drilling gives this, but in broadcast sowing some places receive too much seed, others too little. It collects in furrows and holes, leaving ridges and all the higher parts nearly naked. Crowded roots obtaining but a weak growth, possess so little vitality that an intense cold kills them *in* the ground, and the first thawing and freezing brings most of them on the surface of the soil to perish.

3. Incidental to drill sowing is the fact that the ridges made by the drill teeth lie considerably above the crown of the plant. These settle down, from the winter freezing and rains, around the plant, covering that part of the roots nearest the surface. This protection is not found in broadcast sowing.

4. Although in the United States spring cultivation of wheat is unpracticed, except when harrowed in a few cases, yet, as in England, so it will be here, when labor is more abundant; it will be found highly advantageous to run a cultivator between the drilled rows, to loosen the soil, that weeds may be destroyed, cracks closed, and such pulverization and depth of soil had as will enable the roots to more rapidly enlarge. Such cultivation could not be given to wheat plants sown broadcast.

Thus we have these four things from which the superiority of the drill may be readily inferred. And it is the first three of these which have led to the general expression in behalf of drill sowing, which we find in the foregoing extracts from the letters of correspondents.

It remains only to add, that in portions of the United States, as in the eastern States, where the fields of wheat are small, and, in consequence, each farmer does not wish to incur the expense of a drill, it would be found advantageous for farmers either to club together in the purchase of one, or else to hire the drilling of their fields, as in many places in the west it is done, in past years at from 40 to 50 cents per acre. The seed saved will almost pay for the drilling.

#### STATE OF THE FOREIGN GRAIN MARKETS AND CROPS.

The state of the foreign grain markets, as influenced by the foreign crops, is, at this time of the year, when the foreign harvests are just completed, a matter of much interest to our farmers and dealers in produce. We therefore take from leading English papers the following statements of the harvests, as they progressed during the month of September in Great Britain.

The Mark Lane Express of September 5 says:

"Potatoes here have been much lessened in quantity, the bulk this year being small, though generally healthy. Prices yet rule high compared with wheat,

and are likely to do so, unless heavy shipments come from the continent. Northern Europe has been somewhat in jeopardy respecting the cereal crops, rough weather having prevailed, and some of the wheat has sprouted. Had it not been for the dull reports from England and France, the markets would, in all probability, have risen. The same untoward weather has been reported in Holland and Belgium, which has kept prices from declining, though most of the cereals there have been secured. In France the markets seem to be in a temporary lull, growers being indifferent about sales, and buyers not caring to operate, except in retail."

The same paper, of September 12, remarks of Scotland and the neighboring English counties: "We hear that heavy losses in the field have occurred from high winds. As respects the wheat trade, it has rather flagged, many samples brought to market having wanted condition. With the price of meat ruling high from the long drought, and consequent deficiency of forage, and a prospect of a further rise as Christmas approaches, it is not to be expected that farmers, with only an average crop of wheat at best, will be very anxious to clear out on unfavorable terms. With about double the yield in malting barley, and prices in many instances equal, their attention is much more likely to be drawn to the paying article, and more reserve be put on human food till prices become remunerating. The weather in Europe has been unsettled, but prices have undergone but little change."

The same paper, of September 19, says: "The late high winds, it appears, have proved very destructive in the northern counties and Scotland, where the grain was not harvested, almost reducing the produce to one-half. This, though a severe local calamity, cannot, however, be considered to seriously affect the general yield, which, for wheat, may probably be taken below the average. Of this, enough is now weekly brought to market to make a very quiet trade, and some decline, say about 1 shilling (24 cents) per quarter (8 bushels) has to be noted. Advices from the continent show little change in the prices of grain, but the tendency is generally downwards. In France markets have been quiet, neither buyers nor sellers caring to operate freely. Belgium and Holland have been dull, as well as the interior of Germany, the weather on the whole having been more favorable for the completion of harvest."

The same paper, of September 26, alluding to the drought that had prevailed in Great Britain, says: "The heavy rains of the past week will about remove the last vestiges of the drought, and, as a mild temperature has generally ruled, the effects on the grass lands have been surprising, as a new growth has been imparted to the esculents, which were stunted and tough. The wet has, however, been unfavorable to the completion of the harvest in the north, and in Prussia some amount of cereals has yet to be gathered, with very little prospect of serviceable condition. Importations having still poured in upon the Kingdom on a scale which could only be justified by the utter failure of the crop, and the necessities of the farmers having forced them to send liberal supplies to market, we have generally to note an extreme dullness in the sale of wheat, with a further decline of 1 shilling (24 cents) to 2 shillings (48 cents) per quarter, (8 bushels.) The heavy imports must necessarily go to the granary, the high rate of discount being still against any speculative movement, and in such a state of things there seems to be very little chance of much improvement till Christmas is past, and we can the better estimate not only our own produce, but that of foreign countries. It would indeed seem that our own instances of blight and deficiency have been exaggerated, and that the American advices respecting the shortness of the yield in the federal States have been still more wanting in accuracy, so that the prospect of remunerative prices has become more remote. In France, indeed, some amendment is noted, and as a little while since there was a possibility that French importations would pay in this country, that idea must be given up; but almost everywhere else a sort of



paralysis has come over the grain trade, from which there is, apparently, no immediate relief."

This view of the state of the crops of Great Britain during the month of September is sustained by the *London Economist*, and in its commercial epitome of September 24 it remarks :

"The trade at Mark Lane, to-day, for all descriptions of produce, both English and foreign, was very dull. Even including a few samples of home-grown wheat, of fine quality, which changed hands at Monday's decline in prices, the amount of business transacted was unimportant, and the bulk of the supplies brought forward was left unsold at the close of the business. As regards barley and oats, the tendency of prices was strongly in favor of buyers, and beans could only be disposed of at reduced quotations. At Liverpool, this morning, the grain trade was very dull, and prices declined. Wheat gave way 2*d.* (4 cts.) per cental; flour, 6*d.* (12 cts.) per barrel; and maize 6*d.* per quarter. At Wakefield, a reduction of 1 shilling (24 cts.) per quarter (480 lbs.) took place both in wheat and barley."

There are two causes which have a tendency to produce a temporary depression—the high rate of bank interest, being the unprecedented rate of 9 per cent., and the necessity of renters paying their money rents due at Michaelmas, (29th September.) How far wheat on the continent is injured by unfavorable weather, remains to be seen; but if the quality is impaired, the fine condition and quality of our own will give it preference in the English markets. It is pretty certain that the English harvest is below an average crop, and that it has sustained some injury from wet weather.

It is, however, important to observe the opinion expressed, that France will not export wheat and flour to Great Britain. By reference to the table of imports of wheat, &c., to that country, in this report, it will be seen that France, during the first eight months of this year, sent 161,901,600 pounds of flour to Great Britain, whilst the United States sent but 149,779,056 pounds. France also exported to England about two-thirds as much wheat as this country did. The condition of the wheat crop in France will insure to our own wheat and flour an increased demand.

#### THE GRASS, OAT AND ROOT CROPS OF ENGLAND.

The foregoing remarks on the state of the English and continental crops have especial reference to the wheat crop. But the crops now to be considered are those which affect the feed of farm stock directly, and indirectly that of the human family. The tendency of the farming of Great Britain, for several years, has been to the increase of animals for food. Hence any condition of the crops that lessens the number of these in the market must increase the consumption of the cereals.

There is but one opinion expressed in the English papers of the crops above named—all are far below an average, and some of them, as the hay and turnip crops, so short that English agricultural papers are now discussing very earnestly the best modes of supplying the deficiencies during the coming winter. For the purpose of presenting the shortness of these crops, we take from the *Gardeners' Chronicle* the following extracts.

In that paper of September 10, we have this general account :

"With the exception of the Lincoln, Cambridge, and York fens, which have produced bulky crops, the oat crop in England is sadly deficient. In Scotland, too, the oat crop is thin on the ground, short in straw, and altogether deficient.

"The bean crop is very irregular; on deep loams it is an average, but on the whole this crop is deficient.

"Potatoes generally are of a fine quality; tubers small, but plentiful, and the produce light.

"The turnip crop in the southern, eastern, and in most of the midland counties of England, is a failure. In the fine root-producing counties of Norfolk, Hants, and Berkshire, a few fields of average quality may be witnessed, but these are exceptional, and the greater portion of the area allotted to turnips and mangold is a blank.

"Pastures in the south have suffered severely from the drought, and up to the middle of August presented the most arid appearance. Stock not supported with extraneous food subsisted chiefly on hedgerow leaves and the branches of trees, and it is surprising how they maintained their condition.

"Taking the crops as a whole, wheat is an average, barley fully average, oats one-third deficient, beans under average, potatoes short, roots in the south not one-fourth of a crop; in the north a full average.

"With a light crop of hay, roots a failure, a short yield of straw and barren pastures, it is a matter for serious apprehension on the part of farmers in the south respecting their short supply of food for a full supply of store and fattening stock."

In its paper of September 24, this paper has the following editorial comment on the crops :

"The certainty of at least an ordinary crop of wheat and barley is perhaps sufficient to justify Mr. Disraeli's account at Aylesbury last Wednesday of the cereal harvest generally; but whatever may be thought of his opinion of our wheat and barley crops, there cannot be a doubt of the mistake he made in reference to the almost equally important subject of cattle food. The root crops, which, according to him, are 'not so bad after all,' are simply the greatest failure that the existing generation of farmers has known. All over southern and midland England the turnip crop is a failure, and the wurzels, everywhere extremely patchy, are like the produce of our grass fields, only half a crop.

"The maintenance of our breeding and our young stock in healthy condition, and the maintenance of progress in our fattening stock, is the great agricultural difficulty of the coming winter."

The correspondents of this paper thus refer to the condition of these crops in their respective localities :

**SURREY COUNTY.**—"The failure in the root crop far surpasses anything I have ever witnessed. There seems to be literally nothing in the shape of Swedes or turnips in prospect for the coming winter. Since the recent rains the few roots that remain are putting on a growing appearance, and look like spots in a desert, the gaps are so numerous and extensive all around.

"The usual winter stock of sheep I keep, with the same feeding, would eat everything clean up by the end of November, such is the extent of the failure."

**GLOUCESTER COUNTY.**—"Your inquiry for information on plans for eking out the supply of food for sheep and cattle, which prevails in the southern counties, is not so easily answered, and I fear comes somewhat too late. Linseed cake of prime quality at the present price, about 12 pounds per ton, (60 dollars per 2,240 lbs.,) is an extravagant food. Bran, at 5 guineas (25 dollars) a ton, is far more economical. Lentils and Indian corn, both at present to be bought at from 32 shillings to 34 shillings per quarter, are cheap foods, (\$7 6s to \$8 16 per 8 bushels.) Wheat again is a cheap article to mix with Indian corn."

**SOMERSET COUNTY.**—"Here, too, the failure of the turnip crop is universal, and the remedy proposed is to feed no beasts in the stalls this winter. This portends high prices for meat next spring and summer; and unless the price of oats and Indian corn remains moderate, which can hardly be expected, there will be hard times for the young stock also."

The same paper of October 1, says :

"A large portion of our paper is this week occupied with reports of the past harvest, and with speculations as to the coming winter. In the multitude of

counsellors there is wisdom, and our readers, therefore, will not object to the advice of our many correspondents, notwithstanding it is somewhat monotonous. The unanimity of their recommendations proves them to be all the more trustworthy. The abundance of excellent straw for provender, and the power of making it palatable, and of adding to its feeding power by the addition of meal, linseed, carob pods, salt, and even sugar—this is what every one declares to be our great resource in the difficulty of an almost lost crop of turnips, and of a half crop of hay."

"Wheat," says this paper, quoting from the letter of a correspondent, "could be used with advantage; it would mix well with Indian meal, and tend to make it mellow; it would also make flesh fast. The average price, as you know, is only 40 shillings per quarter, or not quite 9 pounds per ton, (45 dols. per 2,240 pounds.) Using wheat for this purpose might also have a tendency to advance the price; if so, it would benefit the farmer in two ways."

A correspondent writes as follows: "Root crops are generally bad, especially the Swedes; in many cases a total failure. There will be a great loss in lamb hogs (weaned lambs) this winter. Dry food must be given at once; where that is not done they will certainly die."

Another adds: "Second crops, after early potatoes, such as planted mangels, common turnips, &c., are generally a failure; and purchased food, such as Indian corn, linseed cake, cotton cake, linseed, bran, &c., must be resorted to."

Another thus writes: "If wheat continues near its present price a considerable quantity no doubt will be used for feed in the room of cake, &c., and may perhaps have some effect on its price in the ensuing spring."

A fourth correspondent thus advises: "On the whole I should say that there will not be more than a half supply. The hay crop is deficient by a third at least. The grass was all dried up in the pastures, and the autumn growth which our graziers rely upon for the winter will come to nothing, for it is consumed as fast as it grows. There will be no stock of it to carry on, and stock-masters will have to draw on their fodder sooner than usual. Of aftermath there is none. A very large number of beasts must be kept over the winter, which, under ordinary circumstances, should have been sold out at this time. To meet these wants we shall have recourse to the use of Indian corn, or, at the present low prices, of inferior wheat, oats, peas, and beans, all of which are now cheaper than the various descriptions of cake."

It is not necessary to make further quotations from English papers to show the character of the crops there used for stock-feeding. They have so greatly failed that the inferior wheats will be used as stock food; and as our own wheat is unusually excellent, and much of that grown in Europe very inferior, it is clear enough that American wheat will find better sales in the markets of Great Britain than they are now doing, and that prices will improve more next spring and summer than during the coming winter.

Again, the facts and opinions presented in these extracts indicate a favorable demand from Great Britain for our Indian corn. It, therefore, is of much interest to know our capabilities of supplying whatever demand may be made upon our present corn crop. To present some idea of that capability, it becomes necessary to turn to that crop to ascertain what its amount is and what home demand will be made upon it.

#### THE CORN CROP OF THE UNITED STATES FOR 1864.

By turning to the tables of the crops as estimated by this Department, in this report, it will be seen that the corn crop for the past three years is as follows: 1862, 586,226,305 bushels; 1863, 451,967,959; 1864, 530,581,903. That is, the crop of 1864 is less than that of 1862 by 55,644,902 bushels, and greater than that of 1863 by 78,613,444 bushels. The crop of 1862 was much



the largest ever grown in the United States. Not only this, but the home demand upon it was much the greater of any other year. Without referring to the demands of the war, we notice those only arising from the great distillation of 1862, 1863, and the great amount of cattle and hogs fattened upon it.

The pork packed in the west, as far as reported, shows that in 1862-'63 the number of hogs packed was 4,392,085; and in 1863-'64, 3,389,427, showing a decrease of 1,002,658. The return of the fattening hogs, as shown in this report, from the western States, presents a decrease of this year from the last of about twenty-eight per cent., or 949,038. Together, the decrease since 1862 is 1,951,696.

Allowing fifteen bushels of corn as necessary to the fattening of a hog, this number would require 29,275,440 bushels. So that there will be a lessened demand to this amount on the crop of 1864, that there was on the crop of 1862. We have no data by which to determine the additional bushels consumed in distillation in 1862-'63 over what will be the probable amount in 1864-'65, but the present large supplies of whiskey, and its decreased consumption from the high tax, will decrease largely the distillation in 1865. Nor do we know the difference between what was necessary to fatten cattle in 1862-'63, and that which will be required in 1864-'65. But altogether the demand for these objects on the crop of 1864 cannot be less on the crop of 1862 than 20,000,000 bushels. In round numbers we may safely place the lessened home demand for corn for these three purposes at 50,000,000 bushels. Then the greatly lessened number of horses, stock hogs, and cattle, and the greater economy that will be observed in feeding, should not be overlooked. We cannot err much in supposing that the amount of corn for exportation of the crop of 1864 will be fully equal to that of the crop of 1862.

The exports of Indian corn to Great Britain have been as follows: 1861, 24,722,816 bushels; 1862, 21,830,328; 1863, 23,774,976; and in eight months of 1864, 4,564,832. Its price in New York has been as follows: 1861, 72 cts. per bushel; 1862, 64 cts.; 1863, 82 cts.; in January, 1864, \$1 30; and in July, 1864, \$1 68. At the last date, it was selling in England at 85 cts. per bushel, gold value.

#### ENGLISH PRICES.

The general prices in the English markets were as follows at the close of September: Flour, for American, from \$4 56 to \$5 28 per barrel; wheat, from \$1 13 to \$1 29 per bushel of 60 pounds; corn, 78 cts. to 89 cts. per bushel of 56 pounds; rye, 93½ cts. per bushel; barley, 77 cts. to 96 cts. per do.; oats, 42½ cts. per bushel of 33 pounds; meadow hay, from 2 cts. to 2¾ cts. per pound, or from \$40 to \$55 per ton of 2,000 pounds; clover hay, from 2½ cts. to 3½ cts. per pound; potatoes, from \$14 40 to \$15 60 per ton of 2,240 pounds, or from 39 cts. to 42 cts. per bushel of 60 pounds.

These prices may seem to be small compared with present American prices, but it must be remembered that they are based on gold values. To be compared to those of our currency value they should be more than doubled.

#### THE CROPS IN THE PACIFIC STATES AND TERRITORIES.

This Department has endeavored to place itself in regular communication with the States and Territories of the Pacific coast and Rocky mountains. But until railroad connexion is formed with California, it will be impossible to do this so as to report their agricultural condition, as is done that of the nearer States. But with such mail facilities as now had, matters of much interest may be published in our reports, irregularly, of all of them; and hence the continued efforts of this Department to extend its correspondence in these States and Territories. In this article we design to give a general notice of their seasons and crops.

## CALIFORNIA.

In the Bi-monthly Report for March and April a brief statement was made relative to the drought which had prevailed in California during the last winter, and its effects on the agriculture of that State. It prevented the ploughing of the soil, and, consequently, the sowing of the crops. It prevented the growth of pastures, and the farm stock was without food, and in many places without water. When that report was published, rains had commenced to fall, but they were too late for sowing the crops, and too insufficient for much good. The result was such a decreased production as is seriously felt in all branches of business. Speaking of this depression, the Mercantile Gazette of San Francisco, of August 12, says :

"There has been less produced. The producers of course have less to sell, less to pay their debts with, and less to spend. To avail themselves as much as possible of the calamities of the season, or rather, we should say, to make the most of the results of their labor, many are holding back their produce from market in the expectation of further enhancement of prices. The stock-raisers, a very important class of our rural population, have suffered immensely from the drought—in some portions of the country losing three-fourths of their herds, and the remainder totally unfit for market."

The grain crops would not be more than one-half the ordinary yield. Prices had advanced to \$3 25 to \$3 50 per hundred pounds, in gold value, for wheat and corn. Heretofore a large export trade in breadstuffs existed from California to Great Britain, China and Australia. The consequences of the drought to this trade are thus referred to in the same paper of August 2 :

"We remark a decided falling off in our exports, which, for the most part, is owing to the high prices ruling for breadstuffs, occasioned by the partial failure of our wheat and barley crops the present season. For several years past we have exported largely of wheat and flour to England. That trade has now ceased entirely. We also sent her ores and tallow, &c. Not a ship has been despatched from this port to Great Britain for months. A year ago our export trade with China consisted chiefly of shipments of flour and wheat. That traffic has also ceased. A few cargoes of breadstuffs and feed grains have been sent abroad to Australia and New Zealand, the past three months, in exchange for coal, but these have been greatly restricted, owing to the high prices ruling."

Instead of exporting breadstuffs, California has become an importer of them. "We have received this week," says the same paper, of September 5, "1,000 barrels corn meal from New York, and from Oregon about 2,000 quarter sacks of flour, 2,000 bushels of wheat, and 2,000 bushels of oats, &c." Of the receipts of San Francisco from the interior parts of California, it remarks: "Our receipts of flour and grain of the present harvest year have been thus far only about one-half of those of last year. The same remark is true of vegetables, fruits, &c.; and yet the net proceeds have been fully equal to those of previous seasons."

If this Department could have had a full agricultural correspondence in all the counties of the State, and a more limited one on meteorological matters, they would have furnished a most interesting and useful record of this remarkable and destructive drought. But as it is so limited, a very partial account only of them can be now given. And so far as we can speak of it here, we are indebted to Joseph S. Wallis, of Mayfield, Santa Clara county, one of the best correspondents the department has. He thus writes, August 9 :

"I have taken great pleasure in perusing your reports, and find much in them to entertain and instruct, and hope they may have a large circulation among the farmers of this State. It will be a pleasure to me to correspond with your Department, and to render any assistance to you that will enable the

department you have the honor to represent to extend its benefits to California, the laboratory of nature and the Eden of the western world.

"Our seasons being divided into the wet and dry, all our grains are sown between the middle of December and the last of March; consequently we make no distinction in our crops, as winter and spring wheat. The past winter was unprecedentedly dry, and the result has proved very disastrous to the agricultural interests of the State. The grain crops this season will not yield half the average products for the past three years. The hay crop is about fifty per cent. less than that of last year. I am now speaking of the crops throughout the State. In this county the hay crop is at least fifty per cent. more than that of last year, owing to failing grain crops having been cut for hay. In this State hay is chiefly made from the wild oats that is found on the hills and in the valleys throughout the State. None of the cultivated grasses of the older States will grow here. They are not adapted to this climate, for the dry season kills them out. Large quantities of hay are annually made in the State from the volunteer crops of wheat and barley—the latter making an excellent quality of hay, superior to oats. The time is not far distant when California must depend chiefly for her supply of hay upon the volunteer grain crops, as the oat-producing lands are annually growing less productive, they being so closely cut and grazed, that no opportunity is offered the grain to seed itself. I know of lands in this valley (Santa Clara) where, in 1850, the oats grew from five to nine feet high, and very thick, that have not, during the last two years, afforded more than four months of pasturage out of each year. The fact is, the grazing lands of the State have been overstocked the past five years, which has at length resulted in great loss to the farmer and stock-grower. Owing to the excessive drought this summer, there is in most parts of the State great scarcity of pasturage. Immense numbers of cattle have died from starvation, and many more must die before the coming winter. There will not probably be one-third the number of cattle in the State next January there were seven months since. The loss of sheep has been small, as most of them have been driven to good grazing grounds in the mountains, and some have been taken out of the State to Oregon. Large numbers of American horses and cattle have been removed to Oregon from the northern counties.

"The fruit crop this season is but little below the average. The grape crop will, I think, from all that I can learn, be about a fourth below the average. The crop of small fruits is small, such as gooseberries, raspberries, strawberries, and currants. Not only has the drought lessened the crop, but the birds, driven from the mountains for want of food, have destroyed thirty per cent. of the small fruits grown. Young orchards, where there are no means of irrigating, will suffer seriously. Most of the young trees planted last winter will die. In fact I am informed that in some localities the orchards that have been planted five to eight years are feeling the effects of the drought; many of the trees are dying. I have noticed that trees of all kinds have commenced shedding their leaves, at least six weeks earlier than usual.

"We are all hoping for early rains the coming winter; and unless 'all signs fail in dry time,' we will not hope in vain. I anticipate very early rains, at least a month earlier than usual. During the *wet* season the winds invariably blow from the *southeast*, and in the *dry* season from the *northwest*. This summer, however, has proved an exception; the wind has come chiefly from the *southwest*, and variable most of the time when not blowing from the southwest.

"A singular phenomenon occurs annually in this State about the close of the dry season, which thus far has not been accounted for by scientific men. No theory has been advanced as yet that could be supported by the principles of natural philosophy. Usually about five weeks previous to the first rain, the springs and water-courses begin to rise, and continue slowly to rise till the com-



mencement of the wet season. I have resided in the State since early in 1849, and I have never known it to fail. I am informed by old Californians, who were born in the country, that it has always been observed. It is a never-failing freak of nature. This year the water in the small streams and springs commenced rising about the first of August, at least two months earlier than any previous year since 1849. When we consider the fact that the springs and streams are rising, that the foliage has begun to fall from trees and shrubs, and that during the past four months the winds have blown from the sea inland the greater portion of the time, nearly opposite to that it usually does, I think we have good reason to look for rains as early as the middle of October; and I would not be surprised to see rain as soon as the first of October."

The "freak of nature" mentioned by our correspondent is seen here at the close of severe droughts, as well as in California, and is, we think, easy to be explained. In time of severe drought, the winds usually blow from the west and northwest. They are very dry, as will be seen presently, and also highly positively electrified. From both these conditions they absorb moisture in great quantities. Whilst they continue blowing, the waters of springs, rivulets and branches, or creeks, are decreased by this absorption. But prior to the fall of rain, the winds veer to the south and southwest, and being moist and less positively electrified, they absorb but little. Hence there is less evaporation of the springs and rivulets, and being fed by the subsoil moisture with a uniform supply, there must be an increased volume of water in them.

Our correspondent refers to a singular fact, when he states that the southwest wind brought no rain. It must appear extraordinary to one not familiar with the machinery employed by nature for the distribution of moisture to be told that there is a wind blowing over the vast expanse of the Pacific ocean into the land, where so near and lofty a range of mountains as the Nevada are ready to intercept any moisture in them, and precipitate it on the narrow coast valleys. There can, therefore, be no moisture in this wind, although it comes from the ocean. But the phenomenon is susceptible of an explanation, and having an interest to all our readers, as well as to Californians, we here give it, although requiring some space.

The machinery employed by nature for the distribution of moisture is simple, and we take the following brief statement of it from the article on California published in the Agricultural Report for 1862.

"On each side of the equator, when the sun is vertically above it, and reaching to about the fifteenth degree of latitude on each side of it, and moving with the sun as it travels north and south of the equator, is a belt of dry surface winds encircling the earth, and blowing with a uniform and gentle force into the equator. The wind of the north belt blows from the northeast; that of the south belt from the southeast. As these surface winds approach each other, they rise, being expanded by the intense heat of the vertical sun, and become upper currents. The surface or lower currents are called the trade-winds; the upper, the counter trade. Mr. Maury and Mr. Butler maintain that the south belt of trade-wind, when it rises, becomes the northern counter trade or upper current, and the north belt of trade-wind becomes the southern upper counter trade. These currents pass through each other in strata, which may be represented by passing the fingers of the hands between each other. But the generally received opinion is, that these surface currents strike against each other as they ascend, and turn each other back over the hemispheres from which they came. I regard the first opinion as more philosophical, because currents of air more readily stratify than repel each other, and because the southern hemisphere of the earth is chiefly water, the immense evaporations of which are more needed to water the land hemisphere of the north than to be discharged on the ocean, where they are not needed. 'Nothing has been formed without a purpose.'

"Between the points from which these opposing surface belts of wind begin to rise, there is a belt of rains also encircling the earth, and about five hundred miles wide. It is called the rainy belt, and from it pour down those torrents of rain which fall on Central America.

"As these dry surface trade-winds pass over the land and the ocean, they absorb immense quantities of moisture, and their capacity to hold it is increased by the great heat imparted to them from the rays of the vertical sun. After they have risen, and become the upper or counter trade, the north one passes, at first, in a northern direction; but on account of the diurnal rotation of the earth, it is gradually turned to the east, forming the southwest wind, so general during summer in the Atlantic States. As it passes northwards into colder atmosphere it loses its heat; the moisture, in consequence, condenses, and at about fifteen degrees north of the equator portions of the wind and moisture descend to the earth. Other portions having received the latent heat liberated from the moisture that has descended as rain, continue northwards even to the north pole. The portions of the earth receiving these rains are called the extra tropical rainy regions.

"This central rainy belt and these two belts of dry trade-winds follow the sun in its passage north of the equator to the tropic of Cancer, which is nearly to the twenty-fourth degree of latitude. As the northern edge of the dry trade-winds reaches fifteen degrees north of the latitude of the sun, when the latter is at the tropic of Cancer, this northern edge reaches to about the thirty-ninth degree of latitude, being within three degrees of the northern boundary line of California. But before the sun reaches the tropic of Cancer, and after it begins to recede from it, northern California receives the rains that fall beyond the dry trade-winds. Thus this part of the State receives more rain than the southern portion, which is longer covered by the trade-winds."

The northwest wind, therefore, is dry, because in passing from the equator to the pole it has parted with all the moisture it had absorbed, when rising into the upper regions of the atmosphere at the equator. Hence, as our correspondent says, "in the dry season the wind invariably blows from the northwest." During last winter this wind continued blowing from the same direction, instead of from the southeast, as it usually does in winter, which is the wet season. Why it did so we cannot tell, nor do we suppose that meteorology can furnish a satisfactory explanation.

But we have just seen that the wind which brings rain is the southwest wind. Why, then, has it been so dry this summer in California? Simply because the dry trade-wind belt had extended over most of California, and it must have been these dry winds turned from their usual course, by the cause which kept the northwest wind over California during winter. The true moist southwest wind descends to the earth *beyond* the dry trade-wind belt. Hence, although they came over the ocean, they had not yet absorbed the evaporations of the ocean. How far they passed over the ocean, and whether they came from the southern hemisphere or the northern, cannot be determined; but the latter, in all probability.

But why are the winds of the wet season in California from the southeast? Why are they not the southwest winds, as in this part of the Union?

East winds are mere surface winds, and caused by an approaching fall of rain and snow, or condensation. We have them here in winter. But the rain comes from the higher strata of clouds, which are moving from the southwest to northwest. Thus, in some marked rains of the past winter, during which, and for twenty-four hours before their fall, the wind blew constantly from the northeast the newspapers show that they commenced falling from four to six hours at Washington, before they commenced at Boston. They were traced at Baltimore, Philadelphia, New York, and Boston, moving directly against the northeast wind. In California, the Nevada range of mountains run, from the southeast

to the northwest, and by their height they would deflect the southwest winds from their natural direction towards the northwest, or from the southeast. Hence, the eastern winds caused by rains would naturally unite with the deflected southwest winds, and aid their deflection. The union would present the fact stated by our correspondent, "that during the wet season the winds invariably blow from the southeast."

As this machinery follows the sun, the northern edge of the dry trade-winds has been receding to the south since the 21st of June; so that most of California will soon be able to receive the rains brought by the true southwest wind, for the upper current of moist winds coming from the equator descends to the earth immediately beyond the northern edge of the dry trade-winds.

#### COLORADO TERRITORY.

From this Territory we have returns from the following counties: El Paso, Larimer, Boulder, Clear Creek, Conejos, Arapahoe, Huerfano, Pueblo, and Jefferson.

The climate of this Territory varies much according to the altitude of the counties. The winter was a severe one, and rendered the more unfavorable for stock, by reason of the severe drought last fall. Fruit trees in Boulder county, from Iowa and Illinois, set out last year, generally perished, but native seedlings were unhurt. At Boulder City, hay was worth \$60 per ton, and corn 10 cents per pound.

The month of February was pleasant; March, dry and windy; April, snowy, cold, and wet; May, cold and very wet; June, more favorable; and July more so than June. In this last month the grass in the mountains was more abundant than at any previous season, vegetation luxurious, and wild fruits abundant.

In regard to grain crops the returns show a rapid increase in per cent. over the crops of last year. The crops are spring wheat, barley, corn and oats. But summer crops require irrigation. In Huerfano county, which is 35 miles from the foot of the mountains, corn is the staple crop, where frost does not appear until late in October. The increase of these crops ranges from 50 to 500 per cent. according as the county has been longer or more recently settled, but the general average of increased production may be placed at from 75 to 100 per cent.

With a climate so unknown, and in altitudes so various, and so much higher than the farmers have been accustomed to in the States from which they emigrated, agriculture is yet in Colorado an experiment. But the abundant mineral wealth gives great encouragement, and with experience will come greater success. To record that experience and success is the earnest desire of the Department, and therefore it solicits an extensive correspondence from every portion of the Territory, and will be ever ready to give whatever aid it can in the development of its agricultural industry.

#### UTAH TERRITORY.

The counties reporting to the Department from this Territory are Utah, Weber, Washington, San Pete, Beaver, Davis, Salt Lake, and Box Elder.

In February the climate was cold and frosty; in March, cold and windy, with rain in the latter half of the month; the month of April was very dry, but in the latter half of May, fine growing rains fell. In June and July, the weather was dry and wet alternately. There were variations from this state of the weather in some counties, but nothing that demands a particular notice.

During the present season there is no portion of the Union that has made returns indicating as favorable condition of the crops as Utah. There is evidently a steady advance in its agriculture, and the indications are that this



agriculture will aid much in the development of the mineral resources of the Territory.

#### OREGON.

Our returns from this State are too far back in the season to speak of its harvests, and our correspondence too limited to present such a view of the peculiarities of the season as would convey even the remotest idea of what its crops may now be. From Columbia county, in the northern portion of the State, we have the following account of the winter and spring, which is interesting as showing the vicissitudes of a climate so unlike our own :

"We have had," says our correspondent, "a very open winter, snow lying on the ground but four or five days. Heavy frosts in February and March, doing much damage to our fruit crop. I have heard of very few fruit trees being killed. Our fruit crop will come far short of last year. The peach crop entirely killed. Very few grapes cultivated; the vine grows well, but the fruit does not ripen. We have had no rain since April 1, which is unusual in Oregon, especially at this time of the season (June 1,) we generally have abundance. Unless we have some rain soon, our crops will fall short at least one-half. May 6 and 20, very heavy frosts, wilting the leaves and tender shoots of the hazel, and killing the potato vines. Timothy grass does exceedingly well, our average crop being from three to four tons per acre."

In Jackson county, one of the most southern in the State, a continued drought prevailed during the months of June and July. The corn and grass crops were consequently not over a half crop.

#### THE CROPS OF 1864.

The first of the following tables shows the amount of and injuries to the crops of 1864, as returned to this Department by its correspondents, and stated in *tenths*.

The second exhibits the amount of the most important of these crops reduced to bushels, &c., from the first of these tables. It shows, too, the crops for the years 1862 and 1863, that a comparison may be made between them.

Table showing the amounts of and injuries to the crops of 1864, stated in tenths, compiled from the returns of correspondents.

STATES.	WHEAT.		RYE.		BARLEY.		OATS.		CORN.		TOBACCO.		BUCKWHEAT.		POTATOES.		HAY.		FLAX-SEED AND LINT.		SORGHUM.	
	Average amount of crop, compared with 1863.	Injury to grain from all causes.	Average amount of crop, compared with 1863.	Injury to grain from all causes.	Average amount of crop, compared with 1863.	Injury to grain from all causes.	Average amount of crop, compared with 1863.	Injury to grain from all causes.	Average amount of crop, compared with 1862.	Injury to grain from all causes.	Average amount of crop, compared with 1863.	Injury to leaf from all causes.	Average amount of crop, compared with 1862.	Injury to crop from all causes.	Average amount of hay, compared with 1863.	Injury to hay from all causes.	Average amount of seed, compared with 1863.	Average amount of lint, compared with 1863.	Average amount of this crop, compared with 1862.	Injury to the cane from all causes.		
Maine .....	7 $\frac{1}{2}$	7	7 $\frac{1}{2}$	7	6 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	8	12 $\frac{1}{2}$	9	7 $\frac{1}{2}$	8	9 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	11 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
N. Hampshire.	9 $\frac{1}{2}$	7 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	7	7	7	8	8	14	8	8	8	9	8 $\frac{1}{2}$	9	12	11	9		
Vermont .....	11	7 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	7	7	7	10	7 $\frac{1}{2}$	13	8	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Massachusetts.	9 $\frac{1}{2}$	7 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	7	7	7	10	7 $\frac{1}{2}$	13	8	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Rhode Island.	10	11	11	8	9	7	7	7	10	7 $\frac{1}{2}$	13	8	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Connecticut ..	12	9	11	8	11	7	7	7	10	7 $\frac{1}{2}$	13	8	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
New York .....	8 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	11 $\frac{1}{2}$	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
New Jersey ..	8 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	11 $\frac{1}{2}$	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Pennsylvania ..	9	7 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Maryland .....	8	7 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Delaware .....	8 $\frac{1}{2}$	8	9 $\frac{1}{2}$	8 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Kentucky .....	7 $\frac{1}{2}$	6 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Ohio .....	4 $\frac{1}{2}$	6 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Michigan .....	10	7 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Indiana .....	11	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Illinois .....	10 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	12 $\frac{1}{2}$	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Missouri .....	11 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	12	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Wisconsin .....	6 $\frac{1}{2}$	6	7 $\frac{1}{2}$	6 $\frac{1}{2}$	10	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Iowa .....	10	7 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Minnesota .....	7 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Kansas .....	10	7 $\frac{1}{2}$	9 $\frac{1}{2}$	8 $\frac{1}{2}$	11	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
Nebraska Ter'y	7 $\frac{1}{2}$	6 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	10 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	
West Virginia ..	6 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	9	8	8	8	9	8	13	9	9	8	9	11 $\frac{1}{2}$	8 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	11	9	

[illegible]

Table showing the amounts of the principal crops of 1864, in bushels, &c., as estimated from the returns of correspondents, compared with the crops of 1862 and 1863.

STATES.	WHEAT.			RYE.		
	1862.	1863.	1864.	1862.	1863.	1864.
Maine.....	350,815	215,734	167,194	184,389	165,951	128,612
New Hampshire.....	318,954	255,163	251,518	162,033	145,830	109,373
Vermont.....	502,981	452,683	497,951	130,976	130,976	140,798
Massachusetts.....	129,765	129,765	128,143	388,085	388,085	413,957
Rhode Island.....	1,413	1,413	1,413	33,911	33,911	37,302
Connecticut.....	59,901	59,901	71,881	618,762	618,762	721,889
New York.....	13,021,650	13,021,650	10,918,615	5,385,268	5,385,268	5,205,759
New Jersey.....	1,808,128	1,808,128	1,582,113	1,499,497	1,499,497	1,424,523
Pennsylvania.....	15,654,255	15,654,255	12,523,404	6,843,427	6,843,427	6,843,427
Maryland.....	6,553,480	7,208,828	6,487,946	608,901	548,011	529,744
Delaware.....	1,217,254	1,217,254	1,054,954	34,011	37,412	41,153
Kentucky.....	5,546,108	5,546,108	3,882,275	791,447	791,447	554,014
Ohio.....	30,796,032	28,742,963	20,407,503	1,079,040	863,232	704,974
Michigan.....	14,963,735	13,966,153	13,966,153	494,197	494,197	434,894
Indiana.....	20,292,160	20,292,160	22,321,376	444,695	411,343	397,632
Illinois.....	32,213,500	31,408,163	33,371,173	981,322	883,190	850,071
Missouri.....	3,170,690	2,853,621	3,281,514	393,262	219,947	237,542
Wisconsin.....	20,765,781	20,842,359	14,168,317	1,066,241	1,012,929	810,343
Iowa.....	10,541,506	12,649,807	12,649,807	111,266	122,392	119,333
Minnesota.....	2,927,749	2,634,975	2,634,975	155,323	179,791	161,974
Kansas.....	202,252	262,953	201,598	4,713	5,184	4,061
Nebraska Territory.....	150,000	180,600	126,000	2,000	2,000	1,600
Total.....	181,188,089	179,404,036	160,695,823	21,239,451	20,782,782	19,872,975

Table showing the amounts of the principal crops of 1864, &c.—Continued.

STATES.	BARLEY.			OATS.		
	1862.	1863.	1864.	1862.	1863.	1864.
Maine.....	1,002,636	1,002,636	668,424	3,738,423	3,364,581	2,102,994
New Hampshire.....	141,287	127,159	96,278	1,495,365	1,345,829	1,095,891
Vermont.....	94,102	94,102	94,102	4,389,506	3,950,556	3,611,938
Massachusetts.....	168,613	151,752	149,584	1,475,094	1,327,585	1,194,827
Rhode Island.....	51,241	46,117	41,506	253,990	203,192	182,873
Connecticut.....	20,813	20,813	18,732	1,603,936	1,764,329	2,011,334
New York.....	4,882,778	4,882,778	3,710,911	43,968,916	43,968,916	35,724,746
New Jersey.....	33,220	29,098	29,098	5,446,958	4,902,263	5,735,647
Pennsylvania.....	636,859	573,174	630,491	34,233,936	34,233,936	37,657,329
Maryland.....	21,887	19,699	26,591	4,524,912	4,072,421	5,429,894
Delaware.....	4,254	5,105	4,595	1,308,637	1,570,364	2,184,437
Kentucky.....	203,014	302,014	256,713	3,562,772	3,562,772	4,346,326
Ohio.....	1,512,525	1,399,086	1,585,630	10,930,935	12,024,028	14,428,833
Michigan.....	407,885	407,885	338,388	5,430,797	5,430,797	4,810,736
Indiana.....	345,767	311,191	339,198	5,428,755	5,531,630	6,084,193
Illinois.....	1,175,651	1,205,042	1,144,790	17,892,200	19,681,420	24,273,751
Missouri.....	171,377	171,377	162,809	2,660,653	2,128,522	2,128,522
Wisconsin.....	905,323	950,589	674,919	13,271,124	14,598,236	12,043,538
Iowa.....	544,939	599,432	584,446	7,055,583	7,761,141	9,313,369
Minnesota.....	156,412	156,412	148,592	2,934,067	2,053,848	2,259,232
Kansas.....	4,953	5,448	5,901	96,892	116,270	146,500
Nebraska Territory.....	2,486	5,446	4,630	159,954	267,939	223,284
Total.....	12,488,022	11,467,155	10,716,328	171,463,405	173,800,575	176,690,064



Table showing the amounts of the principal crops of 1864, &amp;c.—Continued.

STATES.	CORN.			TOBACCO.		
	1862.	1863.	1864.	1862.	1863.	1864.
Maine.....	1,855,285	1,855,285	1,410,017	.....	7,000	.....
New Hampshire.....	1,668,285	1,835,113	1,334,628	.....	50,000	64,000
Vermont.....	1,585,020	1,743,522	1,585,020	.....	40,000	59,000
Massachusetts.....	2,465,215	2,465,215	2,280,324	4,041,497	5,200,000	6,760,000
Rhode Island.....	458,912	413,021	474,208	.....	1,680	1,848
Connecticut.....	2,059,835	2,059,835	2,059,835	7,550,166	7,500,166	9,900,218
New York.....	24,073,257	24,073,257	22,628,862	7,205,727	10,088,017	12,912,662
New Jersey.....	10,023,336	11,025,669	8,464,262	.....	194,330	179,755
Pennsylvania.....	30,721,821	30,721,821	28,381,685	3,976,982	5,567,774	6,124,551
Maryland.....	14,444,922	14,444,922	10,509,243	40,601,179	48,721,415	33,292,968
Delaware.....	3,892,337	3,892,337	3,892,337	12,123	15,618	14,057
Kentucky.....	48,032,725	52,835,997	42,828,706	.....	113,912,938	56,956,469
Ohio.....	71,792,253	57,433,802	68,202,641	25,528,972	28,081,869	29,017,931
Michigan.....	15,190,137	10,633,097	11,088,801	160,825	207,061	248,473
Indiana.....	92,855,454	54,602,273	74,284,363	9,057,665	10,416,314	8,767,065
Illinois.....	138,356,135	83,013,681	138,356,135	9,452,307	20,397,537	18,867,722
Missouri.....	54,679,118	43,743,205	36,635,011	28,609,948	26,340,505	13,697,063
Wisconsin.....	10,087,053	8,069,642	10,087,053	109,493	153,189	148,083
Iowa.....	49,340,393	34,538,276	55,261,240	375,502	300,402	390,522
Minnesota.....	3,983,426	2,756,898	4,647,329	48,137	43,324	34,659
Kansas.....	6,814,601	8,518,251	4,673,081	21,223	26,881	22,043
Nebraska Territory.....	1,846,785	1,292,750	1,366,622	.....	1,900	1,140
Total.....	586,226,305	451,967,959	530,581,403	136,751,746	267,267,920	197,468,229

Table showing the amounts of the principal crops of 1864, &amp;c.—Continued.

STATES.	BUCKWHEAT.			POTATOES.		
	1862.	1863.	1864.	1862.	1863.	1864.
Maine.....	452,693	407,424	350,837	7,437,053	6,693,348	7,189,151
New Hampshire.....	98,995	98,995	87,447	4,137,704	3,310,163	3,842,154
Vermont.....	233,906	233,906	210,516	5,148,531	3,603,972	5,920,810
Massachusetts.....	123,302	123,302	110,972	3,201,901	2,881,711	3,384,878
Rhode Island.....	3,871	3,871	3,097	543,855	435,084	525,727
Connecticut.....	334,032	300,629	387,477	1,833,148	2,016,462	1,823,148
New York.....	5,976,305	5,378,675	5,677,490	33,059,235	29,753,393	29,753,312
New Jersey.....	1,052,863	947,577	921,256	4,693,151	4,693,151	3,989,179
Pennsylvania.....	6,686,431	5,794,907	7,577,955	14,609,335	14,609,335	12,661,424
Maryland.....	242,672	218,405	189,285	1,517,134	1,213,707	1,061,994
Delaware.....	18,399	18,399	15,641	377,931	302,345	327,540
Kentucky.....	14,187	14,187	14,187	1,131,739	1,449,138	1,255,921
Ohio.....	1,181,947	827,364	1,300,141	5,128,756	4,103,005	4,615,881
Michigan.....	900,652	630,457	823,453	5,264,733	4,738,260	3,422,078
Indiana.....	367,797	183,898	272,171	4,357,271	3,485,617	2,904,847
Illinois.....	431,336	258,802	280,370	6,444,404	5,155,523	4,511,083
Missouri.....	136,719	95,703	72,461	1,493,519	1,493,519	776,630
Wisconsin.....	84,527	59,170	73,258	4,840,631	4,356,568	3,582,068
Iowa.....	276,524	155,914	276,524	3,600,686	2,880,549	2,520,481
Minnesota.....	34,596	20,758	31,714	2,703,926	2,433,534	2,163,141
Kansas.....	44,158	27,966	24,288	354,960	425,952	184,480
Nebraska Territory.....	12,329	6,146	.....	169,762	124,334	106,102
Total.....	18,708,145	15,806,455	18,700,540	113,234,644	100,158,670	96,256,888

Table showing the amounts of the principal crops of 1864, &amp;c.—Continued.

STATES.	HAY.			STATES.	HAY.		
	1862.	1863.	1864.		1862.	1863.	1864.
Maine .....	1,170,859	1,170,859	1,085,705	Ohio .....	2,073,398	1,347,711	1,415,096
New Hampshire.....	771,289	771,289	694,161	Michigan.....	1,135,362	1,059,671	847,737
Vermont.....	985,654	985,654	850,127	Indiana.....	847,096	931,805	962,805
Massachusetts.....	908,289	908,289	760,517	Illinois.....	2,292,831	2,063,548	2,166,725
Rhode Island.....	82,725	82,725	62,044	Missouri.....	467,915	327,541	399,599
Connecticut.....	562,445	562,445	449,956	Wisconsin.....	1,067,248	1,067,248	789,765
New York.....	4,455,982	4,901,580	3,921,264	Iowa.....	848,712	678,970	814,764
New Jersey.....	529,729	423,783	436,496	Minnesota.....	366,603	256,621	249,289
Pennsylvania.....	2,245,420	1,796,336	1,796,336	Kansas.....	63,515	82,569	82,569
Maryland.....	195,244	156,195	167,909	Nebraska Territory.	28,735	22,988	18,391
Delaware.....	40,054	32,043	33,111				
Kentucky.....	118,863	106,977	112,325	Total.....	20,257,968	19,736,847	18,116,751

## COMMENTS ON THE PRECEDING TABLE.

*Wheat.*—The wheat crop of 1864 is less than that of last year by 18,708,213 bushels. Its quality, however, is generally superior; and on this account it will meet with a better demand in the English market, for the wheats of northern Europe have not been harvested in good condition on account of wet weather. Although the crop is less than that of last year, yet the greater abundance of corn and buckwheat will lead to a lessened home consumption, so that the export demand can be met.

*Rye.*—This crop is less by 909,807 bushels than last year's—a difference too small to affect the market value.

*Barley.*—This crop is also less by 750,827 bushels, but it is too small a reduction for further notice.

*Oats.*—There is a favorable increase in the oat crop over last year's. It is 2,889,489 bushels, although there is a great falling off in New York. But the increase in the western States more than compensates for it.

*Corn.*—The long and severe drought of the past summer occasioned great anxiety for the corn crop. Whilst the rains in August came too late in some localities to materially benefit it, and in others some of the fields were too far injured to recover, yet, generally, they were in time to benefit the crop very much. Compared with last year, the crop of 1864 is 78,613,444 bushels greater, and 55,644,902 bushels less than the crop of 1862. But, as shown elsewhere in this report, it is certain that the home demand upon it will be far less than on that of 1862. There will be nearly two millions of hogs less to fatten; a greatly decreased number of cattle to fatten; less farm stock to keep over winter, and a still larger saving effected from distillation. These lessened home demands will render the ability to meet an export demand in 1865 fully equal to that of 1862.

*Tobacco.*—There is a large decrease in this crop. In 1863 it was 267,267,920 lbs., and this year but 197,468,229 lbs.—a difference of 69,799,691 lbs. The chief reduction in the crop of 1864 is to be found in the States of Kentucky, Missouri, and Maryland. The condition of their labor, and the unfavorable season for planting out, are the causes of this reduced production. The scarcity of labor in other States, and the fear that the internal duties would cause a decreased home consumption of the commodity, induced a lessened cultivation.

*Buckwheat.*—This crop has increased 2,994,035 bushels over that of 1863, and is equal to that of 1862.

*Potatoes.*—At one time it was feared this crop would be almost a failure, but the rains of August and September were favorable to it, especially in the north-



eastern States. The northwestern had rains in July, but the latter part of their season was unfavorable. The crop is 3,903,782 bushels less than that of 1863.

*Hay.*—Although this crop is 1,620,096 tons less than that of last year, yet its superior quality will fully compensate for its decrease in weight. It was harvested in the best condition.

Having no basis upon which to estimate the quantities of the following crops they cannot be reduced to numbers, but their comparative increase or decrease by *tenths* can be noticed.

*Flax-seed.*—In the States of New York and Minnesota there is a decrease—in the former State of one-third of a tenth, and in the latter of one and one-third tenth from the crop of 1863. But the other States show a large increase, ranging from one-tenth to four-tenths. The increase in *lint* is not so great, but is much in advance of the crop of 1863.

*Sorghum.*—In the States where this molasses product has been raised in considerable quantities, as in most of the western, there is no great increase above 1862, except in Illinois, where it is two and a quarter tenths. But in nearly all the eastern there is a large increase ranging from one to seven tenths. How far the frost of the 9th of October has injured this crop in the west is not yet known. But it was unusually backward by reason of the long drought; and premature ripening by frost is unfavorable to the production of molasses, either as to quantity or quality. We much fear that our farmers will again experience an unsuccessful season in this new molasses product.

*Cotton.*—The returns from counties in which this product is grown are not many, but, compared with 1862, they show a considerable increase, ranging from one to five tenths. In Illinois it is four-tenths, or forty per cent.

*Root crops.*—There is a large decrease in these in nearly all of the States except Connecticut and West Virginia. In Vermont there is a small increase, but potatoes are not embraced under this head.

*Fattening hogs.*—There is no column of our tables so important as the one that exhibits the number of hogs now fattening. Last year similar inquiries were made, and our estimate, from the returns to them, of the decrease in the number of fattened hogs in the principal hog-producing States of the west was stated at 806,139. The close of the packing season for *all* the western States showed the decreased number to be as follows:

	1862-'63.	1863-'64.
Packed .....	4, 084, 582.....	3, 291, 105
Shipped.....	307, 503.....	98, 322
	<hr/>	<hr/>
	4, 392, 085	3, 389, 427
	3, 389, 427	
	<hr/>	
Decrease .....	1, 002, 658	
	<hr/> <hr/>	

The following table shows the hogs packed in the western States, the tenths decrease of fattening hogs this year below that of last year as returned by correspondents, and the decrease which that will occasion in the number packed during the coming pork season :

States.	No. packed in 1863-'64.	Tenths decrease.	Estimated No. for 1864-'65.
Ohio .....	648, 836	$2\frac{3}{4}$	470, 406
Iowa .....	313, 331	$1\frac{3}{4}$	258, 499
Indiana .....	394, 217	3	275, 952
Illinois .....	1, 273, 390	3	891, 373
Kentucky .....	126, 019	$3\frac{8}{11}$	79, 392
Wisconsin .....	164, 576	$3\frac{5}{8}$	105, 331
Missouri .....	370, 736	3	259, 516
	3, 291, 105		2, 340, 469
	2, 340, 469		
Decrease.....	950, 636		

If the above table represented the hogs *fattened* in the respective States named, its correctness as to the decrease stated might be relied upon, but it shows not the number fattened, but the number packed in each, which is another thing. Thus, for instance, Indiana has less than a third of the number packed in Illinois, whilst it is the greatest hog-producing State in the Union. Illinois not only packs many Indiana hogs, but also largenumbers of Iowa and other States. Nevertheless, the decrease, as shown above, may be considered reliable as a general exhibit of the amount of the deficiency.

In the March and April report of this department we remarked, "The active demand and light prices for the products of pork indicate that the markets will be bare next fall." In support of this view, expressed so far back, we refer to the statement of that well-informed paper, the *Cincinnati Price Current*, which, in its issue of October 19, thus speaks of the present condition of pork markets:

"The stock of old pork and bacon now in the hands of dealers is small, and when new comes into market there will be but little of the old left. A year ago the stock was large, very large, and so were the stocks of American provisions in the English markets at that time, but they are quite small there this fall."

This state of the market, both home and foreign, considered in connexion with the scarcity of hogs, clearly points to the highest possible prices for hogs during the ensuing packing season. We may add that the great want of stock food in England, as is seen from the article in this report on English and foreign harvests, must cause very high prices next spring and summer for meats in Great Britain, and consequently an active demand there for our pork and cut meats.

But home prices will not be governed only by this scarcity here and in Great Britain, but, to a great extent, by the price of gold, which will be influenced by the success of the Union armies, by the numbers of troops in the field next winter and summer, by the extent of foreign imports, and by the quantity of paper money. Whilst all is encouraging as to the success of the Union cause, yet nothing as yet indicates the number of troops necessary to be kept in the field during the winter and summer of 1865. As to imports, they have lessened much, and will, in all probability, continue decreasing. The amount of paper money, it is presumed, will not be materially increased, for,

although the national banks have recently largely increased their circulation, yet they must necessarily be obliged to have nearly an equal amount of greenbacks on hand, with which to redeem their own paper. Victories in the field and decreased imports will be the chief causes affecting prices during 1865, through the lessened value of gold, but the gold values of the chief agricultural products exported will be advanced by the increased foreign demand.

*Fattening cattle.*—The decrease of these is also great, but not to the extent of hogs. A reference to the table of tenths will show it to the reader in each of the States, but, for want of necessary data, we cannot estimate the numbers. We respectfully suggest to Chicago that, as it is now the head of the pork and cattle trade, it should cause full reports to be taken of the entire shipment and packing of all the hogs and cattle of the country, as is now taken of hogs packed in the west at Cincinnati. This department would do so, but it has no power over matters which are commercial, a power which it undoubtedly should possess.

*Quantity of old wheat on hand.*—It will be seen that this is much below the usual amount. It is from two to four tenths, or from 20 to 40 per cent., less than it was in September, 1863. It is, on an average, 30 per cent. less in the greatest-wheat producing States. High prices have brought the new wheat early to a large amount in granaries of buyers, but old wheat may be considered scarce.

*Quality of the new wheat crop.*—Almost everywhere it is much superior to the crop of 1863. It was not only unusually large in the grain, but was harvested with the best of weather. In some places it has a good deal of smut. To the question of the best mode of avoiding this disease and other deteriorating matters of our wheats, attention will be given in the next report.

*Weather.*—The general statement of this in the table shows a highly favorable condition, especially for the recently sown fall crops. The predominance of the favorable and wet weeks gives the best assurance of abundant fall pastures, and of such growth of the wheat as will do much towards its successful resistance of the freezing *in and out* of our winters.

## EXPORTS AND PRICES OF PRODUCE.

[From the Journal of Commerce.]

*Table of the exports from New York of the leading agricultural products, from January 1, 1864, to October 25, compared with those during the same time in 1863, and their prices at New York on the 25th day of October.*

	1864.	1863.	1864.
	From January 1 to October 25.	Same time.	Prices October 25.
Wheat flour.....barrels..	1,713,379	2,170,405	\$9 50 to \$12 00
Rye flour.....do...	2,667	5,055	\$8 75 to \$9 00
Corn-meal.....do...	94,649	122,783	\$7 25 to \$7 90
Wheat.....bushels..	11,842,820	13,664,989	\$2 15 to \$2 33
Corn.....do...	862,966	7,445,102	\$1 60
Rye.....do...	453	416,249	
Barley.....do...	150	52,439	\$1 90 to \$1 96
Oats.....do...	39,310	118,974	90c. to 92c.
Peas.....do...	175,555	86,499	
Cotton.....bales..	25,610	12,639	\$1 25
Hay.....do...	32,835	17,668	\$1 25 to \$1 50
Hops.....do...	17,739	21,562	30c. to 50c.
Leaf tobacco.....hhds..	63,264	46,700	12½c. to 35c.

*Table of the exports from New York—Continued.*

	1864.	1863.	1864.
	From January 1 to October 25.	Same time.	Prices October 25.
Leaf tobacco ..... packages..	60, 358	41, 685	
Manufactured ..... pounds..	4, 412, 417	2, 585, 864	
Petroleum ..... gallons..	18, 377, 820	-----	65c. to 66c.
Pork ..... barrels..	119, 010	161, 368	\$39 50 to \$43 37½
Beef ..... do..	32, 276	33, 818	\$8 to \$24
Beef ..... tierces..	44, 205	35, 473	
Cut meats ..... pounds..	87, 797, 838	170, 573, 369	17½c. to 18½c.
Butter ..... do..	11, 724, 664	13, 143, 125	30c. to 46c.
Cheese ..... do..	38, 557, 711	32, 100, 933	13c. to 22c.
Lard ..... do..	49, 333, 739	107, 683, 994	20c. to 22½c.
Tallow ..... do..	28, 084, 404	35, 241, 807	16c. to 17½c.

*Table of exports of breadstuffs from the United States to Great Britain and Ireland, and to the continent of Europe.*

[From Edward Bill's Grain Circular, New York.]

*Exports of breadstuffs to Great Britain and Ireland from Sept. 1, 1863, to Sept. 1, 1864.*

	Date.	Bbls. flour.	Bush. wheat.	Bush. corn.
New York .....	September 1, 1864	1, 004, 311	15, 054, 624	699, 595
New Orleans .....	September 1, 1864	77, 375	500, 765	583
Philadelphia .....	do	24, 287	60, 239	17, 256
Baltimore .....	do	40, 805	-----	-----
Boston .....	do	95, 026	876, 895	-----
California and other ports .....	do	-----	-----	-----
Total from September 1, 1863, to September 1, 1864. ....		1, 241, 804	16, 492, 523	717, 434
Do.....1862.....do.....1863.....		1, 479, 413	23, 167, 190	10, 334, 356
Do.....do.....1861.....do.....1862.....		2, 672, 515	25, 754, 709	14, 084, 163
Do.....do.....1860.....do.....1861.....		2, 561, 661	25, 553, 370	11, 705, 034
Do.....do.....1859.....do.....1860.....		717, 156	4, 938, 714	2, 221, 857
Do.....do.....1858.....do.....1859.....		106, 457	439, 010	342, 013
Do.....do.....1857.....do.....1858.....		1, 295, 430	6, 555, 643	3, 317, 802
Do.....do.....1856.....do.....1857.....		849, 600	7, 479, 401	4, 746, 278
Do.....do.....1855.....do.....1856.....		1, 641, 265	7, 956, 406	6, 731, 161
Do.....do.....1854.....do.....1855.....		175, 209	324, 427	6, 679, 138
Total for 10 years.....		12, 740, 510	118, 661, 393	60, 879, 241

*To the continent from New York and other ports.*

From September 1, 1863, to September 1, 1864.....	100, 511	333, 819	13, 369
Do.....1862.....do.....1863.....	213, 579	2, 343, 314	68, 957
Do.....1861.....do.....1862.....	626, 672	7, 617, 472	322, 074
Do.....1860.....do.....1861.....	142, 129	3, 452, 496	101, 145
Do.....1859.....do.....1860.....	49, 243	178, 031	19, 358
Do.....1858.....do.....1859.....	51, 388	57, 845	25, 519
Do.....1857.....do.....1858.....	303, 100	390, 428	16, 848
Do.....1856.....do.....1857.....	483, 344	2, 875, 653	543, 590
Do.....1855.....do.....1856.....	748, 408	2, 610, 079	282, 083
Do.....1854.....do.....1855.....	7, 763	4, 972	308, 428
Total for 10 years.....	2, 726, 137	19, 864, 109	1, 701, 371



*Table showing the total acreage of the following crops in Ireland from 1860 to 1864, inclusive.*

Crops.	1860.	1861.	1862.	1863.	1864.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Wheat .....	466,415	401,243	356,321	260,311	279,863
Oats .....	1,968,394	1,999,160	1,977,528	1,953,883	1,809,918
Barley .....	181,099	198,955	192,302	171,892	172,662
Bere and rye .....	12,734	11,582	12,128	8,659	8,992
Beans and peas .....	12,832	14,017	15,202	15,153	16,026
Potatoes .....	1,172,079	1,133,504	1,018,112	1,023,414	1,039,282
Turnips .....	318,540	334,104	376,715	351,436	337,283
Mangel and beet root ..	32,124	22,949	23,222	16,434	14,106
Cabbage .....	22,785	30,020	30,543	34,125	31,756
Carrots, parsnips, and other green crops .....	21,633	19,559	17,713	22,505	23,190
Vetches and rape .....	40,481	31,280	30,830	29,938	29,918
Flax .....	128,595	147,957	150,070	214,099	301,860
Meadow and clover .....	1,594,518	1,546,206	1,552,924	1,560,638	1,608,124

*Imports of wheat, flour, &c., to Great Britain for eight months commencing January 1, 1864, and ending August 31, 1864.*

Imported from.	Wheat, bushels, 70lbs. each.		Imported from.	Wheat, flour, and meal, pounds.	
	1863.	1864.		1863.	1864.
Russia .....	4,418,336	3,959,544	Hanse Towns .....	21,369,824	25,629,712
Prussia .....	5,427,632	5,603,856	France .....	80,773,168	161,901,600
Denmark .....	613,984	1,410,448	United States .....	214,143,216	149,779,056
Mecklenberg .....	421,112	778,536	British America .....	65,174,480	29,817,536
Hanse Towns .....	333,752	809,840	Other countries .....	10,460,128	8,631,056
France .....	105,880	859,216			
Turkey, &c. ....	351,696	602,368	Total .....	391,920,816	375,768,960
Egypt .....	3,487,880	677,272	Indian corn, bushels	16,961,984	4,564,832
United States .....	10,541,600	11,331,496			
British N. America ..	2,247,784	1,147,824			
Other countries .....	620,096	518,128			
Total .....	28,769,752	27,798,528			

This table shows that Russia and Prussia still continue to supply Great Britain with large amounts of wheat. Whilst there is a great falling off in the amount received from Egypt, in consequence of that country directing its agricultural industry chiefly to cotton production, yet France has largely increased its exports of wheat and flour to Great Britain during these eight months of 1864. But recent accounts of the harvest of that nation indicate that it will be unable to maintain these exports in 1865.

The following tables of English imports of cotton, wool, and flax, will be highly interesting to all, for they exhibit the progress that is making by various nations to supply the loss to the world of American cotton.

*Imports and exports of Great Britain of raw textile material from January 1, 1864, to September 1, 1864, compared with the corresponding months of 1863.*

## COTTON.

Imported from.	1863.	1864.
	<i>Pounds.</i>	<i>Pounds.</i>
United States.....	4,149,936	12,171,040
Bahamas and Bermudas.....	15,198,736	24,500,976
Mexico.....	7,476,224	18,342,128
Brazil.....	17,459,688	25,224,464
Turkey.....	6,646,844	16,568,384
Egypt.....	66,697,568	94,463,744
British East Indies.....	202,218,016	247,886,240
China.....	20,986,112	60,252,080
Other countries.....	14,684,880	22,420,944
Total.....	355,519,584	523,040,000
Exported.....	153,813,408	171,014,592
Consumed in Great Britain.....	201,706,176	352,025,408

## WOOL.

Imported from.	1863.	1864.
	<i>Pounds.</i>	<i>Pounds.</i>
British Possessions in South Africa.....	9,333,524	10,290,191
British East Indies.....	11,217,343	7,609,763
Australia.....	60,233,343	78,029,351
Other countries.....	15,001,175	13,009,854
Europe.....	15,002,988	20,538,613
Total.....	110,788,373	129,477,802
Woollen rags torn up to be used as wool.....	13,570,032	15,639,792
Alpaca and Llama.....	1,785,549	1,498,939
Exported.....	126,143,954	146,616,533
	43,322,831	35,612,304
Amount consumed in Great Britain.....	83,821,123	111,004,229

## FLAX.

Imported from.	1863.	1864.
	<i>Pounds.</i>	<i>Pounds.</i>
Russia.....	53,587,408	104,628,160
Holland.....	10,397,632	15,370,880
Belgium.....	10,927,504	12,325,040
Other countries.....	13,104,000	15,989,232
Total.....	88,012,064	148,313,312
Exported, none.....		

## TABLE OF IMMIGRATION.

The following communication and accompanying table, showing the immigration at New York, have just been received:

CUSTOM-HOUSE, NEW YORK,  
*Collector's Office, October 24, 1864.*

SIR: In further compliance with your request of the 29th June last, I transmit herewith a report of the number of emigrants arrived at this port during the months of July, August, and September, 1864.

Very respectfully, your obedient servant,

S. DRAPER, *Collector.*

ISAAC NEWTON, Esq.,

*Commissioner, Department of Agriculture, Washington, D. C.*

*Statement showing the number of arrivals of foreign emigrants in the district and port of New York during the three months composing the quarter ending September 30, 1864.*

	Male.	Female.	Total.
Arrivals in July .....	9,453.....	7,138.....	16,591
Arrivals in August.....	12,946.....	9,079.....	22,025
Arrivals in September .....	7,029.....	5,341.....	12,370
	<u>29,428</u>	<u>21,558</u>	<u>50,986</u>

DISTRICT AND PORT OF NEW YORK,

*Collector's Office, September 30, 1864.*

Through the politeness of Hon. Oliver Warner, Secretary of the State of Massachusetts, Hon. Simeon Draper, collector of the port of New York, W. B. Thomas, esq., and H. W. Hoffman, collectors of the ports of Philadelphia and Baltimore, we are enabled to give the number of emigrants who have arrived at those ports during the year commencing September 30, 1863, and ending September 30, 1864.

Boston.....	5,204
New York.....	177,823
Philadelphia.....	4,483
Baltimore .....	2,203
	<u>189,713</u>

The returns show for eleven months ending November 30, 1863..... 146,519  
And for the year 1862..... 76,306

This shows that notwithstanding the effects of the terrible war in which we are engaged, and the efforts made by our enemies abroad, there has been an enormous increase in the rush of the people of the Old World to a land that promises universal liberty.



# METEOROLOGY.

FROM THE SMITHSONIAN INSTITUTION.

AUGUST.

*Table showing the highest and lowest range of the thermometer, (with dates prefixed,) the mean temperature, and amount of rain, (in inches and tenths,) for August, 1864, at the following places, as given by the observers named. The daily observations were made at 7 o'clock a. m. and 2 and 9 p. m.*

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
MAINE.								
Perry .....	Washington .....	Wm. D. Dana .....	14	80	4	54	62.2	5.54
Steuben .....	do .....	J. D. Parker .....	14	82	31	51	64.0	3.10
Lee .....	Penobscot .....	Edwin Pitman .....	1	90	6, 8, 21, 31	56	67.8	1.85
West Waterville .....	Kennebec .....	B. F. Wilbur .....	1	93	30, 31	57	68.7	3.90
Lisbon .....	Androscoggin .....	Asa P. Moore .....	10	89	30	55	68.3	4.88
Cornish .....	York .....	Silas West .....	1	96	20	52	65.6	8.30
Cornishville .....	do .....	G. W. Guphill .....	1	97	31	56	70.7	8.24
NEW HAMPSHIRE.								
Stratford .....	Coos .....	Branch Brown .....	1	90	19	51	65.3	5.75
Shelburne .....	do .....	F. Odell .....	15	88	19	51	68.0	.....
Barnstead .....	Belknap .....	Chas. H. Pitman .....	1	96	29, 31	60	70.9	4.75
Claremont .....	Sullivan .....	S. O. Mead .....	1	97	19	54	70.3	.....
Do .....	do .....	Arthur Chase .....	13	90	20	50	70.0	7.05
VERMONT.								
Lunenburg .....	Essex .....	Hiram A. Cutting .....	1	100	29, 31	48	.....	3.30
Craftsbury .....	Orleans .....	Jas. A. Paddock .....	1	89	30, 31	50	64.5	4.89
Burlington .....	Chittenden .....	Rev. McK. Petty .....	1	87	19	50	66.8	5.86
Middlebury .....	Addison .....	H. A. Sheldon .....	1	94	31	55	70.4	5.34
MASSACHUSETTS.								
Sandwich .....	Barnstable .....	N. Barrows, M. D. ....	1	90	19	56	71.2	7.18
Topsfield .....	Essex .....	A. M. Merriam .....	1	96	3, 31	59	68.9	3.50
Newbury .....	do .....	Jno. H. Caldwell .....	1	98	31	56	72.2	.....
New Bedford .....	Bristol .....	Samuel Rodman .....	9, 10, 14	84	31	56	68.9	7.62
Worcester .....	Worcester .....	.....	1	91	15	56	71.7	3.11
Baldwinsville .....	do .....	Rev. E. Dewhurst .....	1	93	31	53	65.8	5.56
Mendon .....	do .....	Jno. G. Metcalf .....	1	93	3, 20, 29, 31	58	71.8	3.00
Amherst .....	Hampshire .....	Prof. E. S. Snell .....	1	98	31	55	70.8	4.40
Westfield .....	Hampden .....	Rev. E. Davis .....	1	95	19, 29	56	70.1	3.19
Springfield .....	Berkshire .....	J. Weatherhead .....	1	102	31	50	61.3	2.54
Richmond .....	do .....	Wm. Bacon .....	1	98	4	56	73.6	6.88
Williamstown .....	do .....	Prof. A. Hopkins .....	1	96	31	52	69.3	4.96

Table showing range of thermometer, &amp;c., for August—Continued.

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
CONNECTICUT.								
				°		°	°	In.
Pomfret .....	Windham .....	Rev. D. Hunt .....	1	90	31	54	69.6	3.45
Columbia .....	Tolland .....	Wm. H. Yeomans .....	1	96	31	56	74.3	.....
Middletown .....	Middlesex .....	Prof. John Johnston .....	1	100	31	57	73.8	2.92
Colebrook .....	Litchfield .....	Charlotte Rockwell .....	1	95	31	55	70.3	.....
NEW YORK.								
Moriches .....	Suffolk .....	Mrs. & Miss Smith .....	11	98	30, 31	62	77.2	3.04
Argyle .....	Washington .....	Geo. M. Hunt .....	1	93	29	57	74.8	6.69
South Hartford .....	do .....	G. M. Ingalsbe .....	1	96	19	56	73.9	7.68
Fishkill .....	Dutchess .....	Wm. H. Denning .....	1	94	31	58	74.0	9.56
Garrisons .....	Putnam .....	Thomas B. Arden .....	1	87	31	58	72.0	8.24
Throg's Neck .....	Westchester .....	F. M. Rogers .....	11	94	31	62	75.9	3.72
Deaf & Dumb Inst. .....	New York .....	Prof. O. W. Morris .....	1	96	3, 21, 31	67	79.4	5.19
St. Xavier's College .....	do .....	Rev. Jno. M. Aubier .....	1	95	31	62	76.5	1.66
Flatbush .....	Kings .....	Eli T. Mack .....	11	95	30	61	74.7	2.82
Troy .....	Rensselaer .....	Jno. W. Heimstreet .....	1	97	31	59	72.7	4.97
Schenectady .....	Schenectady .....	Harmon V. Swart .....	1	96	31	58	72.3	.....
Gouverneur .....	St. Lawrence .....	C. H. Russell .....	1	93	30, 31	54	68.6	2.65
Clinton .....	Oneida .....	H. M. Paine, M. D. .....	1	101	31	55	73.5	7.56
South Trenton .....	do .....	Storrs Barrows .....	.....	.....	.....	.....	.....	7.95
Oneida .....	Madison .....	Dr. S. Spooner .....	1	98	30, 31	52	71.3	12.53
Theresa .....	Jefferson .....	S. O. Gregory .....	1	92	31	49	69.7	3.49
Oswego .....	Oswego .....	Wm. S. Malcolm .....	1	90	31	50	69.9	6.66
Palermo .....	do .....	E. B. Bartlett .....	1	97	31	48	69.3	.....
Baldwinsville .....	Onondaga .....	John Bowman .....	1	88	31	51	68.3	.....
Skaneateles .....	do .....	W. M. Beauchamp .....	1	91	31	51	68.6	.....
Auburn .....	Cayuga .....	John B. Dill .....	13	94	31	56	74.9	.....
Nichols .....	Tioga .....	Robert Howell .....	1	99	31	50	70.9	.....
Palmyra .....	Wayne .....	Stephen Hyde .....	1	91	30, 31	52	71.0	.....
Geneva .....	Ontario .....	Rev. W. D. Wilson .....	13	92	30, 31	52	71.2	7.14
Rochester .....	Monroe .....	M. M. Mathews, M. D .....	13	93	30, 31	51	71.4	5.49
Do .....	do .....	Prof. C. Dewey .....	1	92	31	48	70.9	5.49
Wilson .....	Niagara .....	E. S. Holmes, D. D. S. .....	9, 10	97	31	53	73.0	.....
Buffalo .....	Erie .....	Wm. Ives .....	6	90	31	46	70.3	7.57
Jamestown .....	Chautauqua .....	Rev. W. S. Roe, M. D. .....	11	94	31	47	69.9	9.50
NEW JERSEY.								
Newark .....	Essex .....	W. A. Whitehead .....	1, 11	92	31	58	74.6	3.21
Burlington .....	Burlington .....	John C. Deacon .....	11	94	29, 30, 31	60	74.9	2.75
Progress .....	do .....	Thomas J. Beans .....	11	95	30, 31	61	76.1	3.03
Mount Holly .....	do .....	M. J. Rhees, M. D .....	11	92	29, 30, 31	60	76.1	.....
Haddonfield .....	Camden .....	J. S. Lippincott .....	1, 11	91	31	58	75.4	2.53
Greenwich .....	Cumberland .....	Clarkson Sheppard .....	1, 11	88	31	55	72.6	1.52
PENNSYLVANIA.								
Nazareth .....	Northampton .....	L. E. Ricksecker .....	11	98	31	59	76.2	.....
Philadelphia .....	Philadelphia .....	Pf. J. A. Kirkpatrick .....	11	95	31	63	79.3	1.54
Germantown .....	do .....	Thos. Meehan .....	11	100	31	56	.....	.....
Fallsington .....	Bucks .....	Ebenezer Hance .....	11	93	29	60	75.0	1.70
Moorland .....	Montgomery .....	Anna Spencer .....	11	94	31	57	74.2	2.93

Table showing range of thermometer, &amp;c., for August—Continued.

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
PENNSYLVANIA—C'd.								
Silver Spring.....	Lancaster .....	H. G. Bruckhart .....	11	96	30, 31	54	74.0	<i>In.</i>
Berwick.....	Columbia .....	John Eggert.....	11, 13	92	30, 31	58	73.5	7.06
Harrisburg .....	Dauphin .....	John Heisely, M. D. ....	11	93	30	62	77.3	4.92
Tioga .....	Tioga .....	E. T. Bentley .....	11	97	31	50	72.1	5.42
Fleming .....	Center .....	Samuel Brugger.....	10	94	31	55	72.1	6.24
Pennsville.....	Clearfield .....	Elisha Fenton .....	1, 11	93	31	52	69.8	5.69
Blairsville .....	Indiana .....	W. R. Boyers .....	16	97	29, 30	64	75.0	7.80
Connellsville .....	Fayette .....	John Taylor.....	11	92	31	47	72.5	-----
Cannonsburg .....	Washington .....	Rev. Wm. Smith, D.D. ....	11	91	31	50	70.7	4.68
DELAWARE.								
Wilmington .....	New Castle .....	Dr. Urban D. Hedges .....	2, 11, 12, 14	95	31	56	79.6	3.30
MARYLAND.								
Annapolis .....	Anne Arundel ...	Wm. R. Goodman... ..	11	93	31	61	78.8	2.77
St. Mary's city .....	St. Mary's.....	Rev. J. Stephenson.. ..	13	94	31	66	80.4	5.05
Sykesville.....	Carroll .....	Miss H. M. Baer .....	10, 12	90	31	59	75.8	3.00
DIST. OF COLUMBIA.								
Washington .....	Washington .....	Smithsonian Inst'n.. ..	1	95	31	61	78.2	4.94
SOUTH CAROLINA.								
Hilton Head.....	Beaufort .....	Lieut. C. R. Suter .....	3	98	21	76	84.1	3.66
KENTUCKY.								
Louisville .....	Jefferson .....	Mrs. L. Young.....	10	92	31	50	75.9	5.63
OHIO.								
Saybrook .....	Ashtabula .....	James B. Fraser.....	11	90	31	52	71.2	5.85
Austinburg .....	do .....	E. D. Winchester .....	12	92	30, 31	52	71.8	5.44
East Fairfield .....	Columbiana .....	S. B. McMillan .....	11	91	31	55	71.2	5.35
New Lisbon .....	do .....	J. F. Benner .....	10	98	31	52	71.6	4.74
Welshfield .....	Geauga .....	B. F. Abell, A. M. ....	10, 11, 12	90	31	51	71.5	8.23
Milnersville .....	Guernsey .....	Rev. D. Thompson .....	6, 10, 12	95	30	51	-----	7.39
Cleveland .....	Cuyahoga .....	Mr. & Mrs. G. A. Hyde ..	1, 13	90	31	55	73.2	6.71
Wooster .....	Wayne .....	Martin Winger .....	10, 11	95	30	54	73.5	-----
Gallipolis.....	Gallia .....	A. P. Rogers.....	1, 10, 11, 12	92	31	52	72.7	4.39
Kelley's Island.....	Erie .....	Geo. C. Huntington .....	11	91	31	58	75.0	3.20
Norwalk .....	Huron .....	Rev. A. Newton.....	10, 12	90	31	50	70.5	4.98
Kingston .....	Ross .....	Prof. Jno. Haywood .....	10	96	30, 31	56	75.2	2.29
Portsmouth .....	Scioto .....	L. Engelbrecht .....	11, 12	89	31	55	75.3	3.55
Urbana .....	Champaign .....	Prof. M. G. Williams .....	11	95	31	50	72.6	5.47
Hillsborough.....	Highland .....	J. McD. Mathews .....	10	92	31	53	73.7	3.70
Ripley .....	Brown .....	Dr. G. Bambach .....	9	102	31	58	76.9	3.58
Bethel .....	Clermont .....	Geo. W. Crane.....	6, 7, 10	95	31	50	74.1	4.25
Cincinnati .....	Hamilton .....	G. W. Harper.....	7	97	30, 31	57	76.0	3.42
College Hill.....	do .....	Jno. W. Hammitt .....	12	96	30, 31	62	78.1	6.88
Do .....	do .....	I. H. Wilson .....	8, 10, 13	88	30	59	74.6	4.35



Table showing the range of the thermometer, &amp;c., for August—Continued.

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
<b>MICHIGAN.</b>								
Ypsilanti .....	Washtenaw .....	C. S. Woodard .....	8, 11	92	31	51	73.8	2.26
Agricultural College	Ingham .....	Prof. R. C. Kedzie .....	11	99	30	46	70.7	0.40
Garlick .....	Ontonagon .....	Edwin Ellis .....	10, 11	92	29	52	68.7	.....
<b>INDIANA.</b>								
Pennville .....	Jay .....	Miriam Griest .....	10	104	31	49	76.7	.....
Muncie .....	Delaware .....	E. J. Rice .....	15	97	30, 31	52	.....	4.75
Spiceland .....	Henry .....	Wm. Dawson .....	9	97	30	53	73.3	3.40
New Castle .....	.....do .....	Thos. B. Redding .....	9	99	31	50	73.0	4.16
Madison .....	Jefferson .....	Rev. Sam'l Collins .....	9, 15	91	31	60	78.0	10.00
New Albany .....	Floyd .....	Dr. E. S. Crozier .....	10	92	31	55	73.4	4.87
South Bend .....	St. Joseph .....	Reuben Burroughs .....	9, 10	98	18, 30	54	71.2	0.94
Indianapolis .....	Marion .....	Royal Mayhew .....	12	95	31	53	73.9	2.40
Bloomington .....	Park .....	Wm. H. Hobbs .....	8	98	28	50	74.3	.....
New Harmony .....	Posey .....	Jno. Chappellsmith .....	9	92	19	61	75.8	5.11
<b>ILLINOIS.</b>								
Evanston .....	Cook .....	Homer W. Scovill .....	12	86	21, 22	58	72.5	0.83
Chicago .....	.....do .....	Samuel Brooks .....	11	93	31	54	72.5	.....
Riley .....	McHenry .....	E. Babcock .....	10	95	18	52	69.6	1.32
Sandwich .....	DeKalb .....	Dr. N. E. Ballou .....	9, 10	95	22, 29, 30	54	71.4	1.08
Ottawa .....	La Salle .....	Mrs. E. H. Merwin .....	10	102	29	54	72.1	1.85
Winnebago .....	Winnebago .....	Jas. W. Tolman .....	10, 11	95	18, 19	54	70.7	1.88
Tiskilwa .....	Bureau .....	Verry Aldrich .....	14	94	19	52	72.3	.....
Wyanet .....	.....do .....	E. S. Phelps, Jr. ....	8	97	18	47	73.8	1.75
Peoria .....	Peoria .....	Frederick Brendel .....	8	97	21	55	75.2	1.56
Pekin .....	Tazewell .....	J. H. Riblett .....	8	93	31	58	74.6	2.46
Monroe City .....	Monroe .....	Miss F. E. Whelpley .....	12	92	31	51	71.2	3.35
Hoylton .....	Washington .....	J. Ellsworth .....	9	100	21	58	77.0	2.13
Waverly .....	Morgan .....	Timothy Dudley .....	2	94	17, 18, 19, 21	61	75.1	1.55
Mount Pleasant .....	Henry .....	Rev. E. L. Briggs .....	24	94	29	58	73.7	1.85
Galesburg .....	Knox .....	Pf. Wm. Livingston .....	8, 10	90	31	53	72.4	2.22
Vermont .....	Fulton .....	Patterson Hamer .....	10	95	31	54	76.5	0.59
Manchester .....	Scott .....	Dr. J. & Miss Grant .....	15, 24	92	20	58	75.2	1.88
Augusta .....	Hancock .....	S. B. Mead, M. D. ....	24	92	21	55	73.1	1.29
<b>WISCONSIN.</b>								
Manitowoc .....	Manitowoc .....	Jacob Lüps .....	8, 9, 10	88	30, 31	48	68.5	3.16
Milwaukee .....	Milwaukee .....	Carl Winkler .....	12, 13	89	30, 31	55	70.1	0.73
Do .....	.....do .....	I. A. Lapham, LL.D. ....	9	92	31	49	69.8	0.61
Green Bay .....	Brown .....	Friedrich Deckner .....	8	92	31	47	69.6	2.36
Geneva .....	Walworth .....	Wm. H. Whiting .....	9, 10, 11	90	19	50	69.6	.....
Waupaca .....	Waupaca .....	H. C. Mead .....	10	98	30, 31	52	73.8	.....
Embarrass .....	.....do .....	J. Everett Breed .....	8, 11	98	31	40	72.5	3.41
Beloit .....	Rock .....	Wm. Porter .....	10	96	30	50	70.9	1.77
<b>MINNESOTA.</b>								
Beaver Bay .....	Lake .....	C. Wieland .....	8	88	29, 31	52	66.2	2.28
St. Paul .....	Ramsay .....	Rev. A. B. Paterson .....	9	93	17, 29	53	71.3	2.00
Mankota .....	Blue Earth .....	Wm. Kilgore .....	14	95	17, 18	50	.....	.....
New Ulm .....	Brown .....	Charles Roos .....	9, 10	97	17	54	74.5	2.00

Table showing the range of the thermometer, &amp;c., for August—Continued.

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
IOWA.								
Lyons.....	Clinton .....	P. J. Farnsworth, M. D.	10	94	31	56	72.2	8.10
Dubuque.....	Dubuque .....	Asa Horr, M. D.	10	95	20	52	72.4	1.35
Guttenburg.....	Clayton .....	P. Dorweiler .....	9, 10	88	20, 30	58	71.5	3.00
Monticello.....	Jones .....	Chauncey Mead .....	10	95	20	53	71.0	2.37
Independence.....	Buchanan .....	D. S. Deering .....	9, 10	95	19	55	71.0	.....
Do .....	do .....	A. C. Wheaton .....	10	98	17, 20	52	72.3	3.50
Iowa City .....	Johnson .....	Theo. S. Parvin, A. M.	8	91	20	50	73.0	7.60
Fort Madison .....	Lee .....	Daniel McCready .....	15	97	19, 20	52	74.2	2.37
Waterloo .....	Black Hawk .....	T. Steed .....	8, 9	90	19, 25	54	73.0	.....
Iowa Falls .....	Hardin .....	N. Townsend .....	9	91	19, 29	50	70.4	2.60
Algona .....	Kossuth .....	Dr. & Miss L. McCoy	10	96	18	50	71.7	1.50
Onawa .....	Monona .....	Dr. Rich'd Stebbins.	8, 9, 24	92	18	54	72.4	.....
MISSOURI.								
Allenton .....	St. Louis .....	Aug. Fendler .....	26	99	22	55	74.1	1.66
Canton .....	Lewis .....	Geo. P. Ray .....	12	95	19, 20	56	74.1	3.24
Harrisonville .....	Cass .....	John Christian .....	1	100	28	64	.....	4.44
KANSAS.								
Manhattan .....	Riley .....	H. L. Denison .....	1	99	19	56	78.3	1.84
Fort Riley .....	Davis .....	Elford E. Lee .....	31	107	17	65	82.1	2.44
NEBRASKA.								
Elkhorn City .....	Washington .....	Miss A. M. J. Bowen	24	99	17, 18	57	74.0	.....
Bellevue .....	Sarpy .....	Rev. Wm. Hamilton.	24	91	18	58	75.2	1.48
OREGON.								
Auburn .....	Baker .....	S. M. W. Hindman .....	17	95	12	50	72.5	6.41
UTAH TERRITORY.								
Great Salt Lake City	Great Salt Lake	W. W. Phelps .....	5	95	13	62	77.9	12.50
CALIFORNIA.								
Sacramento .....	Sacramento .....	T. M. Logan, M. D.	28	94	31	62	74.7	0.89
Weadon Valley.....	Plumas .....	Mrs. M. D. Smith...	12	97	30	49	65.7	2.40

Table showing the average temperature and fall of rain (in inches and tenths) for the month of August, in each year named, and for the five years first named, collectively, with the average number of places in each State in which the observations were made.

States and Territories.	Av. number of places.	Averages, 1855.		Averages, 1856.		Averages, 1857.		Averages, 1858.		Averages, 1859.		Av. for five years.		Averages, 1863.		Averages, 1864.	
		Mean temp.	Mean rain.	Mean temp.	Mean rain.	Mean temp.	Mean rain.	Mean temp.	Mean rain.	Mean temp.	Mean rain.	Mean temp.	Mean rain.	Mean temp.	Mean rain.	Mean temp.	Mean rain.
Maine.....	9	Deg. 62.4	In. 3.9	Deg. 63.8	In. 3.2	Deg. 64.2	In. 5.6	Deg. 63.6	In. 4.6	Deg. 66.9	In. 2.5	Deg. 61.2	In. 4.9	Deg. 66.8	In. 3.3	Deg. 66.8	In. 5.12
New Hampshire.....	4	61.9	2.5	65.9	8.4	66.6	9.9	65.1	4.1	58.7	3.4	61.3	4.0	66.4	4.8	68.9	5.85
Vermont.....	4	62.4	2.9	64.8	8.4	67.4	9.9	65.5	3.6	58.7	3.4	61.3	4.0	66.4	4.8	68.9	5.85
Massachusetts.....	12	66.1	3.2	65.5	11.1	67.4	5.1	66.0	3.5	63.8	4.6	66.4	5.8	67.6	4.6	67.2	4.83
Rhode Island.....	1	67.9	2.0	69.8	5.9	66.8	4.8	66.1	3.2	63.2	3.7	68.0	4.9	69.3	4.6	68.6	4.72
Connecticut.....	4	67.4	2.0	67.6	10.7	68.6	5.0	66.5	4.4	67.3	7.0	67.5	3.8	70.3	4.6	72.0	3.19
New York.....	84	67.9	2.4	66.1	4.8	61.0	4.7	63.4	3.3	68.8	3.8	66.7	3.8	62.6	5.4	72.4	6.15
New Jersey.....	4	70.7	2.9	70.3	4.8	72.3	6.9	70.4	3.3	70.0	4.6	70.7	4.5	76.6	4.1	75.0	2.61
Pennsylvania.....	26	71.4	3.3	69.6	4.1	69.6	4.8	71.5	3.4	71.2	4.1	70.6	4.0	73.6	2.6	74.0	4.80
Delaware.....	1	72.6	5.9	70.1	5.1	72.5	5.9	77.3	4.3	73.2	5.5	76.0	5.4	79.0	3.30	79.6	3.30
Maryland.....	1	74.9	2.9	72.6	4.2	73.5	10.2	74.7	2.6	74.2	3.2	72.4	4.4	78.5	0.51	78.3	3.61
District of Columbia.....	5	68.7	4.4	78.6	7.7	79.3	4.9	76.3	4.8	75.9	6.5	79.0	6.3	78.2	0.86	78.2	4.91
South Carolina.....	5	76.4	4.6	73.0	4.0	73.2	3.5	76.3	2.6	75.3	4.6	74.8	4.2	78.2	0.86	78.2	4.91
Tennessee.....	4	75.4	4.4	72.6	3.5	73.3	3.6	75.6	2.3	72.6	6.4	73.9	4.0	78.2	0.86	78.2	4.91
Kentucky.....	18	72.9	4.1	68.3	1.9	69.9	3.6	71.5	4.4	71.3	3.9	70.6	3.6	72.8	2.7	73.6	5.63
Ohio.....	8	68.5	2.3	63.0	1.4	66.7	4.3	69.2	4.0	69.0	3.6	67.7	3.0	70.3	5.6	71.1	4.91
Michigan.....	4	74.0	4.4	71.3	2.9	72.9	4.3	73.7	4.0	73.6	4.3	73.1	4.0	73.6	2.6	74.4	4.45
Indiana.....	13	71.7	4.1	70.4	2.8	72.7	4.5	72.5	3.0	72.2	2.5	71.9	3.4	72.9	2.4	73.3	1.72
Illinois.....	9	67.7	1.8	66.9	1.9	67.4	3.6	68.9	3.6	68.9	1.8	68.1	2.5	69.3	3.1	70.6	2.01
Wisconsin.....	3	63.4	10.5	63.4	2.7	67.8	3.9	66.2	4.1	65.9	4.1	65.9	5.0	67.0	3.2	70.7	2.01
Minnesota.....	3	68.6	3.3	67.8	1.6	71.0	5.8	71.9	3.3	72.5	1.8	70.4	3.2	74.9	5.2	74.1	3.60
Iowa.....	2	74.0	6.5	73.4	4.4	73.4	3.5	78.7	2.9	76.1	2.9	75.3	4.0	77.7	3.3	74.1	3.11
Missouri.....	2	74.0	6.5	73.4	4.4	73.4	3.5	78.7	2.9	76.1	2.9	75.3	4.0	77.7	3.3	74.1	3.11
Nebraska Territory.....	2	74.0	6.5	73.4	4.4	73.4	3.5	78.7	2.9	76.1	2.9	75.3	4.0	77.7	3.3	74.1	3.11
Nebraska.....	2	74.0	6.5	73.4	4.4	73.4	3.5	78.7	2.9	76.1	2.9	75.3	4.0	77.7	3.3	74.1	3.11
Kansas.....	2	74.0	6.5	73.4	4.4	73.4	3.5	78.7	2.9	76.1	2.9	75.3	4.0	77.7	3.3	74.1	3.11
California.....	2	74.0	6.5	73.4	4.4	73.4	3.5	78.7	2.9	76.1	2.9	75.3	4.0	77.7	3.3	74.1	3.11



AUGUST, 1864.

## THE DROUGHT.

We append a few notices in continuation of those previously given on the prevalence and extent of the drought.

*Santa Barbara, California.*—"The absence of almost any rain during the past winter has made this part of the State almost a desert. I do not think more than an inch and a half of rain has fallen since last spring. The cattle have nearly all died, and the face of the country is as barren as the streets of a city. More rain fell last month than in all the rest of the season together; while, in ordinary years, May has little rain. Instead of rain storms, which usually come from the southeast, we had, during the months of February, March, and April, a succession of northwesterly winds, blowing with great violence from about 10 a. m. till 8 or 10 p. m., which is also a strange phenomenon here."—*W. W. Hays, M. D., June 1, 1864.*

*Sacramento, California.*—With the exception of the season of 1850-'51, the past, which ends with the present August, has been characterized by a drought as disastrous as it is remarkable. Never have the streams and springs been so completely dried up before, or the water in the Sacramento river been observed at so low a point. Fortunately, just as navigation had become difficult in the extreme, a heavy rain, unprecedented as to the extent of territory over which it spread as well as its duration and quantity, came most opportunely to swell the shallow streams. Owing to the immense quantities of rain that fell north of the American river, the Sacramento rose some fifteen inches.

*Fort Madison, Iowa.*—August, a very dry month; pastures bare, and wells low and failing.

*Waverly, Illinois, August 31.*—August has been remarkable for its extreme drought. The wells and streams are very low, water for stock very scarce, and many families on short allowance for family use. The pastures are parched and dry. The corn crop has been injured to some extent by drought, but a much better crop than last year.

*Pomfret, Connecticut, August 31.*—The drought is greater here than has been known for many years. Wells are getting dry that are not wont to fail; grass for the cattle fails.

*Mendon, Massachusetts, August 31.*—Water in well but once as low as now in the last thirty-eight years.

*Windsor, Nova Scotia, September 14.*—"The drought has not extended to these regions. There was a good deal of rain about seed-time, then a drought till the middle of hay-time, when there were heavy falls of rain, and the weather has been upon the whole wet ever since. Private letters from England (Suffolk) received a fortnight since, informed me that the drought there had been excessive, the ponds being drier than ever remembered to have been before."—*J. D. Everett.*

## AURORA.

*August 24, 1864.*—On the night of the 24th of August a beautiful arch of light, extending from horizon to horizon through or near the zenith, was observed over a wide extent of country. The following notices, taken from the registers, describe it as seen by observers from Maine to Minnesota:

*Cornish, Maine.*—August 24.—A faint aurora in the evening.

*Steuben, Maine.*—August 24.—Aurora at 9 p. m.; a faint white arch half-way up north star.

*Mendon, Massachusetts.*—August 24.—Aurora in a single jet from NW. to the zenith; very beautiful at 10 p. m.

*Worcester, Massachusetts.*—August 24.—At 11 p. m. the sky was spanned

from east to west with a bright, well-defined belt of greyish white, extending from horizon to horizon, and passing a little south of the zenith. There was no appearance of aurora in the northern horizon, but the phenomenon was undoubtedly auroral in its character.

*Skaneateles, New York.*—August 24.—A singular aurora appeared from 9 to 11 p. m., in the form of a single belt, dividing the hemisphere into two equal parts. The eastern portion of the bow moved slowly southward.

*Buffalo, New York.*—August 24.—An uncommon auroral phenomenon was visible here August 24, at about 10 o'clock p. m. It consisted of a luminous bow extending from fifteen to twenty degrees above the horizon north of the star Arcturus, passing a little north of Corona through Lyra and Cygnus, and easterly as far as Andromeda. At its lowest extremity, which appeared to be its commencement, it was very luminous and much more dense than the tail of a comet. It made its appearance almost suddenly and my first impression was that it was one of those wanderers paying us an unexpected visit. I soon discovered that it varied in intensity, and overhead slight scintillations were visible. At the extremity above named it was only a degree or two in width, but as it extended upwards to Lyra and Cygnus it was fifteen to twenty degrees wide and continued about the same to its furthest extremity, where it became very thin and rare. The wind was blowing gently from the south, but the whole of this arch moved in an opposite direction. There was but very little auroral light in the northern horizon, no clouds to be seen, but summer-lightning all around. During the twenty minutes that I viewed this phenomenon there were several small meteors visible. To-day (25th) at noon, we had a tempest, after which much wind from the southwest.—*Henry Mills.*

*Wilson, New York.*—August 24.—Aurora made a fine display to-night, commencing at 9.45 o'clock, by showing a beam of white light in the W.N.W. from the horizon to  $45^{\circ}$  high; also faint diffused light in the north. At 10 o'clock the beam had extended completely over the heavens from W.N.W. to E.S.E. by E., forming a brilliant bow or band of light from horizon to horizon, with a slight inclination to the south. At each end the bow seemed to touch the horizon by a fine point, (a little the more distinct at the westerly end,) and gradually expanded to the zenith, where it was about one degree in width. There was hardly any change except that it gradually grew fainter till 11 o'clock, when there was only a trace to be seen.

*Rochester, New York.*—August 24.—Splendid auroral arch spanned the heavens at  $10\frac{1}{2}$  p. m., south of zenith, from S. of E. to N. of W. when in zenith, and was a bright white band or arch of fine shining fibres; disappeared at east first, then higher up, till at 11 it was gone. All over the north was the glow of the brightest and most magnificent white canopy of light I ever saw.—(*Dewey.*)

*Rochester, New York.*—August 24.—Shortly before 10 p. m. discovered a beautiful luminous arch of auroral light, two degrees in width, extending entirely over from NW. to SE. When first seen it was one continuous stream of light, but subsequently broke into several parts, which soon became united again to complete the arch. At times these portions would reunite by a general movement eastward, but at others by the spaces between them becoming reilluminated, thereby restoring the whole line. The eastern third remained more intact. At 10.30 the western half only remained, and that much narrower. At 11 p. m. all had disappeared. During the whole evening there have been frequent flashes of lightning at the north, though very few clouds were visible, the northern sky having more the appearance of moderate aurora borealis. At the centre the band was about two degrees in width, tapering nearly to a point at each extremity.—(*Mathews.*)

*Palmyra, New York.*—August 24.—Ten minutes after 10 p. m., discovered an aurora, consisting of a perfect arch, extending from the horizon at NW. to the horizon at the SE., of a uniform white color, retaining the same apparent

position for twenty or twenty-five minutes, when it disappeared. There were dark clouds in the north, also lightning in that direction; could not discover any aurora in any other part of the sky. The part of the sky where it appeared was clear. There was no wind at the time.

*Canonsburg, Pennsylvania.*—August 24.—Aurora.

*East Fairfield, Ohio.*—August 24.—A well-defined auroral arch, of near fifteen degrees elevation at 8 p. m., which entirely disappeared before 9. Saw no streamers.

*Austinburg, Ohio.*—August 24.—Aurora appeared at 8 p. m., black cloud underneath; disappeared at 9½.

*Winnebago, Illinois.*—August 24.—Aurora through the evening; faint light in the north.

*Embarrass, Wisconsin.*—August 24.—Singular aurora at 10½ p. m., continuing half an hour; it was in the form of a bow, extending entirely across from east to west, nearly overhead, and very bright. At the same time there was a slight bank of aurora to the north.

*Green Bay, Wisconsin.*—August 24.—Aurora, a narrow steadily shining belt, of pure white, extended across the heavens, a little north of the zenith from the east to the west horizon; it remained thus less than an hour, and gradually vanished.

*Manitowoc, Wisconsin.*—August 24.—Aurora at the north from 9 to 10 p. m.

*Dubuque, Iowa.*—August 24.—Aurora from 10 p. m. to 4 a. m. next morning; quite brilliant after midnight.

*Mankato, Minnesota.*—August 24.—Auroa at 8.30 p. m.; commenced as a faint spot of light in the northwest. First arch formed at 9 p. m., the upper portion just below the pole star; arch very distinct, but no cloud below. Beams moved constantly along the arch for twenty minutes, moving from east to west. At 9.40 a second arch formed below the first, more brilliant, and with dark cloud below. The first arch disappeared entirely at 10 o'clock, and reappeared in a few moments more brilliant than before. At 10.15 beams from the lower arch appeared.

*New Ulm, Minnesota.*—August 24.—Aurora at 8.30 p. m.

#### STORM OF AUGUST 26, 1864.

Below are a few notices of the weather at some of the western stations at the time of the hurricane, which was so severe in the southeastern part of Indiana.

*Urbana, Ohio.*—August 26.—Thunder from 5¾ a. m. to 9 a. m.; very heavy at 7½ a. m. A peculiar morning. There was a very heavy fog early, and it did not disappear till after the very hard rain at 7½ a. m. There was thunder again from 5 p. m. to 7 p. m.; a violent gale blew from the west from 5¾ to 6½ p. m. No damage was done by the wind in this immediate neighborhood. Lightning off south at 8 p. m.

*East Fairfield, Ohio.*—August 26.—A storm of wind from the NW. commenced at 6 p. m., succeeded by rain and much thunder and lightning until 8 p. m.

*Saybrook, Ohio.*—August 26.—Heavy dew in the morning. At 5 p. m. heavy thunder storm from W.S.W.

*West Milton, Miami County, Ohio.*—August 26.—The storm gathered in the north between 4 and 5 p. m. The heavens became very black, and there was one constant roll of thunder. The storm moved south, passing overhead. The rain fell in torrents, accompanied with hail for perhaps ten minutes. The hail was confined to a very narrow strip of country, or it would have done great damage. Now and then a hail-stone fell of great size and peculiar structure; one of the largest which I measured was seven inches in its greatest circumference; the shape was the usual nucleus of hard ice, surrounded by concentric layers, but flat, and on the outer rim covered with jagged points of ice, looking



like large flattened chestnut-burrs. A man in the neighborhood said he weighed one of these monsters in a spring scale, and it weighed nearly a pound.—(*G. W. Harper, of Cincinnati.*)

*Austinburg, Ohio.*—August 26.—Thunder shower at 5.15 p. m., with high wind. Lightning north and east at 9 p. m.

*Cleveland, Ohio.*—August 26.—Overcast most of the day. Furious wind and heavy rain after 4½ p. m.; three-quarters of an inch of rain fell in ten minutes.

*Kingston, Ohio.*—August 26.—The rain this morning came up with thunder and lightning. This evening, at 6½ o'clock, the thunder and lightning were severe. At 9 o'clock p. m., there is still lightning, but it is not raining.

*New Lisbon, Ohio.*—August 26.—Storm of rain, wind, thunder, and lightning, from 6 a. m. to 1 p. m.

*Kelley's Island, Ohio.*—August 26.—Very violent shower from 3.30 p. m. to 4.15 p. m. Wind very strong from NW. For a few moments hailstones, size of hazelnuts, and some still larger, fell in large quantity, doing considerable damage to grapes. An inch and two-hundredths of water fell in three-fourths of an hour.

*Newcastle, Indiana.*—Very heavy rain and thunder storm from 4½ to 5 a. m. during which time it rained an inch and six-tenths. Showers at noon and 5½ p. m. Incessant lightning in S. and SE. all the evening, quite distant and low down.

*New Albany, Indiana.*—August 26.—A severe rain-storm occurred to-day. At 6 a. m. the wind was SW., with dark clouds to the westward, with heavy thunder. At 7¼ or 7½ a. m. it commenced raining, the water coming down in a perfect deluge—the wind rapidly changing from the SW. to W., then NW., and finally to NE. About one inch of rain fell within an hour and a half. About noon, the wind having changed back to the SW., another storm came up, in which nearly another inch of rain fell. Soon after sunset another cloud came up, but the amount of rain did not exceed fifteen-hundredths of an inch. So great a quantity of rain has not fallen in one day in this vicinity for several years. At 9 p. m. the sky was clear, with the exception of a low bank of clouds to the southward, constantly illuminated by a blaze of sheet-lightning; wind NW.

*Indianapolis, Indiana.*—August 26.—About 3½ p. m., dark clouds in NW. from this point were rising, with lightning and heavy thunder; supposed 15 to 20 miles distant. These bore round N. and NE.; the main dark clouds, rising about 45° above the horizon, were darker, and moved with greater velocity than usual thunder-storms. About 4 p. m., or a little earlier, the main force of this cloud had passed over, and in its track northward, clouds broken and agitated, without special direction, had taken its place, rising higher than the storm-cloud. About this time, 4 p. m., a succeeding thunder-storm of ordinary magnitude, rising in NW., was advancing towards this place, and at the same time clouds rising in southwest were coming up and passing overhead with great velocity toward the NE. The clouds seemed to threaten a storm for some time, but settled in a brisk shower, without wind, at 4½ to 4¾ p. m.

*Lawrenceburg, Dearborn county, Indiana.*—Seventy-five miles southeast of Indianapolis, about a quarter before six o'clock in the afternoon of August 26, the train on the Indianapolis railroad, which left Cincinnati at 4.20 p. m. for Chicago, was blown from the track at a point near Wirtnell's bridge, fifteen miles below Lawrenceburg, by one of the most terrific tornadoes that has ever visited that section of the country. As the train approached the bridge, the atmosphere seemed filled with branches of trees and missiles of various kinds, which the wind had taken up in its path; and the engineer, thinking the bridge unsafe, increased the speed of the engine, so as to reach the protection of the hills beyond. He was too late; for the hurricane, resistless in its energy and



overwhelming in its power, lifted the entire train into the air, and hurled the rear portion of it over a steep bank; the baggage car, which was very heavily laden, being whirled diagonally across the track; and the rear of the first passenger car, still uncoupled, being suspended over the precipice at the side of the track. The train was heavily loaded with passengers, from thirty to forty of whom were injured. With the violent blasts of wind came also torrents of rain.—*Newspaper.*

*Spiceland, Indiana.*—August 26.—Began to rain and thunder about 3½ a. m.; hard thunder and heavy rain at a quarter before 6; rained some in the afternoon; appearance of storm in SW. about 3 to 4 p. m.

*Madison, Indiana.*—August 26.—Two inches of rain fell from 5 a. m. to 12 m.

*Dubuque, Iowa.*—August 26.—The wind blew in a gale nearly all day from the NW.; most violent about 11 a. m., with a very dark blue sky, and occasionally a white scudding cloud of small size. The barometer gradually fell, and reached its lowest point at about 5 p. m., after which it began to rise. The hygrometer showed a very dry state of the atmosphere all day.

#### FROST.

*Tioga, Pennsylvania.*—August 30, 31.—A very little frost on the hills.

*Rensselaer, Indiana.*—August 31.—Light frost in the morning; the first of the season; did no injury to anything.

*Pennville, Indiana.*—August 27.—Very light frost in places, doing very little, if any, damage. Frost here every month this year, and also last year.

*Oshtemo, Michigan.*—August 30.—Frost this morning, and hurt the crops in low places. 31st, frost again this morning.

*Green Bay, Wisconsin.*—August 30.—Temperature last night almost to the freezing point. Mean temperature to-day, 54.7°, the lowest of the month.

*Embarrass, Wisconsin.*—August 30.—At 5 a. m., thermometer 37°; on the 31st, at the same hour, 38°.

The same day on which this frost occurred was, at some stations further west, the warmest day of the month.

*Fort Laramie, Idaho.*—August 31.—This was the warmest day of the month. The temperature at 2 p. m. was 100°; at 9 p. m., 84°; the mean of the day, 86°; all which were the highest during the month; wind from the southwest.

*Manhattan, Kansas.*—August 31.—The temperature at 2 p. m. (98°) was higher than on any day except the first, when it was 99°.

*Fort Riley, Kansas.*—August 31.—Wind very hot and strong from 12 m. until 4 p. m. Temperature above 100° until 5½ p. m. At 2 p. m., 107°; mean of the day, 99.66°. The warmest day of the month.

## SEPTEMBER.

Table showing the highest and lowest range of the thermometer, (with dates prefixed,) the mean temperature, and amount of rain, (in inches and tenths,) for September, 1864, at the following places, as given by the observer's name. Daily observations were made at the hours of 7 a. m. and 2 and 9 p. m.

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
MAINE.								
Steuben .....	Washington .....	J. D. Parker.....	28	72	18, 22	38	53.6	4.10
West Waterville....	Kennebec .....	B. F. Wilbur .....	1	76	22	40	56.1	3.25
Lisbon .....	Androscoggin....	Asa P. Moore.....	1, 2	77	26	35	55.3	6.03
Cornish .....	York .....	Silas West.....	1	71	26	35	52.2	3.70
Cornishville .....	do .....	G. W. Guptill .....	1, 2	72	26	39	56.5	3.97
NEW HAMPSHIRE.								
Shelburne .....	Coos .....	Fletcher Odell .....	1	79	27	33	55.1	.....
Stratford .....	do .....	Branch Brown.....	2	72	22, 26	32	51.3	5.11
Barnstead .....	Belknap .....	Chas. H. Pitman....	2	79	26	40	58.4	3.38
Claremont.....	Sullivan.....	Arthur Chase.....	27	78	17, 26	40	58.0	3.10
Do .....	do .....	Stephen O. Mead...	26	80	25, 26	42	58.1	.....
VERMONT.								
Lunenburg .....	Essex .....	H. A. Cutting .....	9	78	18, 26	32	55.6	2.75
Craftsbury.....	Orleans .....	Jas. A. Paddock....	27	73	26	34	51.6	4.80
Calais .....	Washington .....	Jas. K. Tobey .....	27	72	26	35	51.6	.....
Burlington.....	Chittenden .....	Rev. McK. Petty....	27	69	26	38	54.0	5.49
Middlebury .....	Addison .....	H. A. Sheldon .....	3, 18	70	26	42	56.0	8.32
MASSACHUSETTS.								
Sandwich .....	Barnstable .....	Eugene Tappan ....	3	84	26	44	61.7	2.32
Newbury .....	Essex .....	Jno. H. Caldwell .....	24	77	26	39	57.5	.....
Topsfield .....	do .....	A. M. Merriam .....	27	82	8	42	59.6	2.40
New Bedford .....	Bristol .....	Sam'l Rodman.....	2	72	26	40	57.5	2.19
Worcester .....	Worcester .....	F. H. Reed .....	28	82	27	43	59.3	2.93
Mendon .....	do .....	Jno. G. Metcalf.....	28	79	26	40	58.8	2.45
Amherst.....	Hampshire .....	Prof. E. S. Snell....	2	75	26	41	57.8	2.92
Springfield .....	Hampden .....	J. Weatherhead ....	2, 27	88	26	36	59.2	2.61
Westfield .....	do .....	Rev. E. Davis .....	2, 3	77	8	40	57.8	2.86
Richmond .....	Berkshire .....	Wm. Bacon .....	1, 22	78	26	36	.....	6.38
William's College .....	do .....	Prof. A. Hopkins .....	27	77	26	41	56.6	3.06
CONNECTICUT.								
Pomfret .....	Windham .....	Rev. D. Hunt .....	27	76	26	40	57.7	3.07
Columbia.....	Tolland .....	Wm. H. Yeomans ..	3	80	8, 9	38	61.3	.....
Middletown.....	Middlesex .....	Prof. Jno. Johnston..	3	84	8	42	61.3	3.45
Colebrook .....	Litchfield.....	Charlotte Rockwell..	2	76	26	39	57.9	.....
NEW YORK.								
South Hartford .....	Washington .....	G. M. Ingalsbe.....	27	79	26	44	60.9	4.55
Fishkill .....	Dutchess .....	Wm. H. Denning ...	2, 3	77	31	43	60.6	3.62
Garrison's .....	Putnam .....	Thos. B. Arden.....	2	72	1, 26	47	61.0	3.40
Throg's Neck.....	Westchester .....	F. M. Rogers .....	27	78	26	48	63.2	4.90
Deaf and Dumb Inst	New York.....	Prof. O. W. Morris..	2, 24, 27	80	17	55	65.7	5.45

Table showing the range of the thermometer, &amp;c., for September—Continued.

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
NEW YORK—Cont'd.								
St. Xavier's College	New York	Rev. Jno. M. Aubier	27	79	26	50	63.5	5.14
Flatbush	Kings	Eli T. Mack	27	78	26	46	61.1	4.34
Schenectady	Schenectady	Harmon V. Swart	27	80	26	41	57.3	.....
Gouverneur	St. Lawrence	C. H. Russell	23	76	30	34	59.4	5.65
Clinton	Oneida	H. M. Paine, M. D.	3, 27	82	26	45	62.0	2.72
South Trenton	do	Storrs Barrows						3.64
Theresa	Jefferson	S. O. Gregory	3	80	26	35	56.5	4.30
Oswego	Oswego	Wm. S. Malcolm	23	77	26	41	58.9	1.85
Palermo	do	E. B. Bartlett	23	81	26	36	57.7	2.70
Baldwinsville	Onondaga	John Bowman	3, 23	72	26	42	57.0	.....
Skaneateles	do	W. M. Beauchamp	27	76	26	40	57.0	.....
Auburn	Cayuga	John B. Dill	23	82	26	45	63.7	.....
Palmyra	Wayne	Stephen Hyde	23	80	26	47	61.0	.....
Nichols	Tioga	Robert Howell	27	88	17, 21, 30	44	59.0	.....
Rochester	Monroe	Prof. C. Dewey	23	80	17	42	59.3	1.83
Jamestown	Chautauqua	Rev. S.W. Roe, M. D.	7	86	30	44	59.3	3.80
NEW JERSEY.								
Newark	Essex	W. A. Whitehead	2, 27	77	26	44	62.2	4.68
Mount Holly	Burlington	M. J. Rhees, M. D.	24	78	26	47	63.8	.....
Progress	do	Thos. J. Beans	2	80	12, 26, 30	52	63.1	6.28
Haddonfield	Camden	J. S. Lippincott	24	79	25, 26	50	63.4	6.55
Greenwich	Cumberland	C. Sheppard	24	75	26	47	60.6	4.28
PENNSYLVANIA.								
North Whitehall	Lehigh	Edward Kohler	24	78	20	42	61.0	.....
Nazareth	Northampton	L. Ricksecker	2	82	30	45	63.5	.....
Fallsington	Bucks	Ebenezer Hance	2, 22, 24	78	26	51	63.7	4.10
Philadelphia	Philadelphia	Pf. J. A. Kirkpatrick	24	81	26	53	66.8	7.32
Germantown	do	Thos. Mehan	2	86	8, 12	50	.....	.....
Moorland	Montgomery	Anna Spencer	2	78	26	48	62.0	5.66
Harrisburg	Dauphin	Jno. Heisely, M. D.	10, 24	79	20	53	65.2	12.36
Fleming	Center	Samuel Brugger	9, 10, 17, 20	78	20	42	60.8	6.66
Pennsville	Clearfield	Elisha Fenton	22	80	20	40	57.7	4.32
Blairsville	Indiana	W. R. Boyers	1, 2, 4, 5, 26	72	14, 22, 24	48	60.0	16.91
Connellsville	Fayette	John Taylor	2, 5, 23	78	12	44	61.6	.....
Cannonsburg	Washington	Rev. W. Smith, D. D.	2	75	1, 25	44	59.8	8.55
DELAWARE.								
Wilmington	New Castle	U. D. Hedges, M. D.	3, 24, 29	80	25	51	66.7	8.80
MARYLAND.								
Annapolis	Anne Arundel	Wm. R. Goodman	24	82	26	50	67.2	3.65
St. Mary's City	St. Mary's	Rev. J. Stephenson	5, 24	82	26	54	70.1	2.85
Sykesville	Carroll	Miss H. M. Baer	24	80	8, 20, 25	52	64.0	3.50
DIST. OF COLUMBIA.								
Washington	Washington	Smithsonian Instit'n	24	81	20, 26	52	66.0	2.57

Table showing the range of the thermometer, &amp;c., for September—Continued.

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain
SOUTH CAROLINA.								
Hilton Head .....	Beaufort .....	Lieut. C. R. Suter ..	3	° 98	21	° 76	° 86.8	In. 2.86
KENTUCKY.								
Louisville .....	Jefferson .....	Mrs. L. Young.....	4, 23	84	19	39	67.8	4.33
OHIO.								
Austintown .....	Ashtabula .....	E. D. Winchester ...	22, 23	78	13, 28	44	58.0	5.85
Saybrook .....	do .....	Jas. B. Fraser .....	22	77	28	46	60.8	4.55
New Lisbon .....	Columbiana .....	J. F. Benner .....	14, 23	80	20, 26	42	60.5	5.97
Welshfield .....	Geauga .....	B. F. Abell, A. M. ...	9, 10	76	24, 25	46	60.5	7.54
Cleveland .....	Cuyahoga .....	Mr. & Mrs. G. A. Hyde	23	80	25, 30	50	63.1	5.19
Wooster .....	Wayne .....	Martin Winger .....	10	81	13	44	63.0	.....
Gallipolis .....	Gallia .....	A. P. Rodgers .....	2, 5	82	13	44	65.7	3.46
Kelley's Island.....	Erie .....	Geo. C. Huntington..	10, 23	80	25	50	64.4	4.89
Norwalk .....	Huron .....	Rev. A. Newton .....	23	83	25	44	61.2	5.11
Westerville .....	Franklin .....	Pf. H. A. Thompson..	10, 23	80	20	48	63.0	2.83
Kingston .....	Ross .....	Pf. John Haywood..	2	87	13, 24	50	65.5	3.49
Portsmouth .....	Scioto .....	L. Engelbrecht .....	14	81	13	48	66.5	4.70
Urbana .....	Champaign .....	Pf. M. G. Williams..	2, 13, 10	80	25	42	63.1	3.71
Hillsboro' .....	Highland .....	J. McD. Mathews .....	2	84	25	44	64.5	3.32
Ripley .....	Brown .....	Dr. G. Bambach .....	23	86	20	45	67.4	6.55
Bethel .....	Clermont .....	Geo. W. Crane .....	2	84	24	42	63.2	7.66
Eaton .....	Preble .....	Miss Ollittippa Larsh.	23	81	25	47	63.0	10.90
College Hill .....	Hamilton .....	I. H. Wilson .....	3	84	25	50	65.9	2.50
Do .....	do .....	John W. Hammitt .....	2	84	26	50	62.5	.....
Cincinnati .....	do .....	George W. Harper .....	2	88	19	44	65.7	8.63
MICHIGAN.								
Pontiac .....	Oakland .....	James A. Weeks .....	23	79	12, 25	40	57.6	.....
Monroe City .....	Monroe .....	Miss F. E. Whelpley ..	10	83	25	45	60.8	3.28
Agricultural College	Ingham .....	Prof. R. C. Kedzie .....	9	79	25	41	59.6	3.40
INDIANA.								
Spiceland .....	Henry .....	William Dawson .....	2	84	25	42	63.8	4.90
New Castle .....	do .....	T. B. Redding, A. M.	3, 23	86	19	40	63.1	5.89
Madison .....	Jefferson .....	Rev. S. Collins .....	23	83	19	49	.....	5.75
New Albany .....	Floyd .....	Dr. E. S. Crozier .....	5	85	25	45	68.8	1.64
South Bend .....	St. Joseph .....	Reuben Burroughs .....	22	85	30	38	60.9	4.33
Indianapolis .....	Marion .....	R. Mayhew .....	3, 10	84	19, 25	41	64.3	3.19
Rensselaer .....	Jasper .....	Dr. J. H. Loughridge	2, 3	87	19	34	64.7	5.55
New Harmony .....	Posey .....	John Chappellsmith ..	4	91	25	46	69.4	2.65
ILLINOIS.								
Chicago .....	Cook .....	Samuel Brookes .....	1	85	24	37	59.0	.....
Ottawa .....	La Salle .....	Mrs. E. H. Merwin .....	9	94	24	36	63.8	2.58
Winnebago .....	Winnebago .....	James W. Tolman .....	9	86	24	39	61.8	3.57
Wyanet .....	Bureau .....	E. S. & Miss L. Phelps	3	98	28	36	65.7	3.38
Tiskilwa .....	do .....	Verry Aldrich .....	3	92	24, 25, 28	40	64.5	.....
Hennepin .....	Putnam .....	Smiley Shepherd .....	10	95	31	48	74.7	.....
Peoria .....	Peoria .....	Frederick Brendel .....	3	98	19, 24	43	67.3	4.81



Table showing the range of the thermometer, &amp;c., for September—Continued

Place.	County.	Observer's name.	Date.	Max.	Date.	Min.	Mean.	Rain.
ILLINOIS—Cont'd.				°		°	°	In.
Elmore .....	Peoria .....	W. H. Adams .....						3.50
Pekin .....	Tazewell .....	J. H. Riblett .....	3	96	24	44	66.7	4.65
Hoylton .....	Washington .....	J. Ellsworth .....	2, 3	104	19	43	69.5	2.00
Waverly .....	Morgan .....	Timothy Dudley .....	3	93	24	44	68.2	3.65
Galesburg .....	Knox .....	Prof. Wm. Livingston .....	3	92	24	38	63.6	2.16
Augusta .....	Hancock .....	S. B. Mead, M. D. ....	3	100	28, 30	45	66.9	4.16
WISCONSIN.								
Manitowoc .....	Manitowoc .....	Jacob Lüps .....	10	72	30	34	58.1	3.29
Milwaukee .....	Milwaukee .....	I. A. Lapham, LL.D. ....	9	84	25	40	61.0	2.93
Green Bay .....	Brown .....	Friedrich Deckner .....	17	77	24, 28, 29	36	58.3	7.74
Geneva .....	Walworth .....	William H. Whiting .....	9	78	24	40	60.3	.....
Delavan .....	do .....	Levens Eddy .....	9	82	24	37	60.1	3.74
Embarrass .....	Waupaca .....	Edward E. Breed .....	26	80	28	27	58.0	4.36
Waupaca .....	do .....	H. C. Mead .....	2	82	24, 28, 29, 30	42	.....	.....
Beloit .....	Rock .....	William Porter .....	9	84	24	41	61.8	3.90
MINNESOTA.								
Beaver Bay .....	Lake .....	C. Wieland .....	8	70	30	32	52.5	2.32
St. Paul .....	Ramsey .....	Rev. A. B. Paterson .....	9	93	17, 29	53	71.3	2.60
New Ulm .....	Brown .....	Charles Roos .....	9	93	28	32	62.7	0.48
IOWA.								
Lyons .....	Clinton .....	Dr. P. J. Farnsworth .....	13	86	24	40	64.7	2.60
Dubuque .....	Dubuque .....	Asa Horr, M. D. ....	9	89	24	39	63.4	2.29
Guttenberg .....	Clayton .....	Philip Dorweller .....	9	84	24	42	63.3	6.80
Monticello .....	Jones .....	Chauncey Mead .....	13	90	28	34	60.1	1.17
Independence .....	Buchanan .....	A. C. Wheaton .....	9	89	29	34	65.2	4.00
Do .....	do .....	D. S. Deering .....	13	87	24	37	62.4	.....
Iowa City .....	Johnson .....	Theo. S. Parvin, A.M. ....	13	92	24	36	66.9	2.12
Fort Madison .....	Lee .....	Daniel McCready .....	3	97	24	37	66.7	2.57
Waterloo .....	Black Hawk .....	T. Steed .....	13	88	28, 29	40	63.2	1.88
Iowa Falls .....	Hardin .....	N. Townsend .....	9, 21	86	19, 24	40	64.3	2.14
Algona .....	Kossuth .....	Dr. & Miss McCoy .....	9	89	24	32	60.9	2.31
MISSOURI.								
Allenton .....	St. Louis .....	A. Fendler .....	2	107	19, 25	37	67.9	3.37
Canton .....	Lewis .....	George P. Ray .....	3	103	19	38	68.1	5.24
Easton .....	Buchanan .....	P. B. Sibley .....	1	104	29	36	68.9	3.62
KANSAS.								
Manhattan .....	Riley .....	H. L. Denison .....	1, 3	104	24	42	70.9	2.30
Fort Riley .....	Davis .....	H. A. Sturges .....	1, 2	106	30	52	75.7	2.15
NEBRASKA TER.								
Elkhorn City .....	Washington .....	Miss. A. M. J. Bowen .....	2	99	24	32	66.4	.....
Bellevue .....	Sarpy .....	Rev. Wm. Hamilton .....	2	99	24, 30	40	67.4	1.77
UTAH TERRITORY.								
Great Salt Lake City	Great Salt Lake ..	W. W. Phelps .....	10	87	28	45	65.9	7.43

Table showing the average temperature and fall of rain (in inches and tenths) for the month of September in each year named, and for the five years first named, collectively, with the average number of places in each State in which the observations were made.

States and Territories.	Av. number of places.	Averages, 1855.		Averages, 1856.		Averages, 1857.		Averages, 1858.		Averages, 1859.		Av. for five years.		Averages, 1863.		Averages, 1864.	
		Mean temp.		Mean temp.		Mean temp.		Mean temp.		Mean temp.		Mean temp.		Mean temp.		Mean temp.	
		Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.
Maine.....	9	56.4	1.8	58.8	3.5	57.8	1.6	58.8	3.5	55.9	4.0	57.6	3.9	55.9	3.08	51.7	4.22
New Hampshire.....	4	59.2	0.3	60.1	4.9	58.7	1.3	58.1	3.0	48.2	4.2	56.9	3.1	51.9	2.31	56.2	3.86
Vermont.....	4	58.1	4.5	58.3	4.0	57.8	1.8	59.0	3.8	56.0	4.2	57.8	3.7	56.3	3.42	53.8	5.34
Massachusetts.....	12	61.1	1.0	61.4	4.8	60.8	2.9	61.1	3.8	58.4	4.0	62.2	3.3	58.5	3.38	58.6	3.01
Rhode Island.....	1	61.9	0.3	62.2	5.1	60.3	2.3	62.2	3.1	59.6	3.7	61.5	2.9	57.8	1.74		
Connecticut.....	4	62.4	0.5	63.4	4.1	61.5	2.3	61.4	4.9	59.1	4.0	61.6	3.3	58.1	2.31	59.6	3.96
New York.....	81	62.2	1.9	61.9	3.7	61.2	2.8	61.2	3.7	59.3	4.2	59.8	3.3	56.9	2.31	60.2	3.86
New Jersey.....	4	63.4	2.9	63.1	2.8	63.3	2.7	63.6	1.5	62.1	7.3	64.3	3.5	60.0	1.30	62.6	5.45
Pennsylvania.....	20	66.7	4.5	64.1	2.4	64.4	1.7	61.1	1.7	62.7	7.0	64.4	3.3	62.4	2.52	61.9	8.24
Delaware.....	1	66.5		68.4		68.4	2.5	71.8	2.7		4.8	68.9	4.7	61.1		68.7	8.80
Maryland.....	5	67.8	8.0	66.3	2.2	66.3	1.4	65.1	3.6	66.3	8.4	66.5	3.3	63.3		67.1	3.33
District of Columbia.....	1	70.1	2.9	67.4	1.9		1.6	66.5	2.9	67.2	5.8	67.8	3.0	63.3	3.09	66.0	2.57
South Carolina.....	5	78.2	3.0	72.6	2.1	75.2	1.4	72.0	9.0	74.1	3.1	74.4	3.1			86.8	2.86
Tennessee.....	2	73.8	7.3	65.1	1.4	69.7	1.4	69.7	1.8	69.4	3.4	69.7	3.1				
Kentucky.....	4	74.5	4.7	64.8	1.4	69.1	2.3	67.3	2.8	67.4	3.2	68.6	2.9				
Ohio.....	18	69.7	5.4	63.3	2.4	65.4	1.4	63.0	1.6	62.9	3.4	65.3	2.9			67.8	4.33
Michigan.....	8	65.0	6.0	57.8	3.1	61.6	2.6	60.3	3.1	63.5	3.3	61.6	3.6	62.1	2.18	63.4	5.38
Indiana.....	4	71.5	5.7	63.1	0.7	67.7	1.6	66.2	2.9	65.2	5.4	66.7	3.3	64.5	2.05	62.7	3.34
Illinois.....	13	69.9	2.6	63.3	3.0	66.4	2.2	65.1	3.7	62.3	3.0	65.4	2.9	63.2	3.07	65.0	4.45
Wisconsin.....	9	63.0	58.4	58.4	3.5	61.8	3.8	60.6	4.1	58.0	3.0	60.4	3.8	58.3	1.27	59.7	3.43
Minnesota.....	3	60.4		49.9		60.0	3.0	57.8	3.6	55.4	3.6	56.7	3.4	59.1	1.87	62.2	1.57
Iowa.....	8	67.1	4.7	61.5	2.9	65.2	2.4	63.7	3.7	61.6	2.9	63.8	3.3	62.2	3.65	63.7	2.79
Missouri.....	2	73.1	3.9	65.6	2.9	70.0	2.1	71.3	2.6	65.4	4.4	69.3	2.4	63.0	2.86	68.3	4.08
Nebraska Territory.....	2					75.3	2.5	64.9	2.6	63.0	2.1	67.7	2.4	65.6	1.75	66.9	1.77
Kansas.....	4					70.6		69.8	2.5	68.3	1.9	69.5	2.2	72.6	0.55	73.3	2.33
California.....	2			71.1	0.0	65.1	0.0	68.7	0.0	68.8	0.0	68.2	0.0				

## SEPTEMBER, 1864.

## FROST.

*Wolfville, Nova Scotia.*—September 8.—First appearance of frost on low land.

*Steuben, Maine.*—September 6.—Hard frost this morning. 8th, very heavy frost this morning; ground looked almost as if very white with snow till 6 a. m. 18th, a severe frost; ground almost as white as if covered with snow; water froze an eighth of an inch thick.

*Cornishville, Maine.*—September 26.—Slight frost, first of the season, no injury done.

*West Waterville, Maine.*—September 7.—Slight frost in low places near the river. 18th, slight frost, not enough to kill vines, beans, or potatoes, cut off vegetation in other locations in this vicinity. 22d, slight frost.

*Shelburne, N. H.*—September 26.—A few flakes of snow falling at 8.30 a. m. 27th, heavy frost, ground said to be frozen in some places.

*Barnstead, N. H.*—September 7, 27.—Light frost.

*Claremont, N. H.*—September 17, 18.—Slight frost; no damage done except in particularly exposed places.

*Stratford, N. H.*—September 18.—Frost this morning.

*Craftsbury, Vermont.*—September 22.—A slight frost this morning, the first of the season; sufficient to kill pumpkin and cucumber vines, but having no effect on late planted potatoes, which are as green as in July.

*Middlebury, Vermont.*—No frost in September; very unusual.

*Lunenburg, Vermont.*—September 7.—A very slight frost on boards, &c., this morning, nothing injured by it. 18th, a slight frost on the hills, hard on low lands; but everything so ripe that no harm was done.

*Westfield, Mass.*—No frost during the month that has done any damage, except in some very cold spots, where it here and there nipped the ends of the leaves of a squash vine.

*Worcester, Mass.*—September 8.—Frost this morning.

*Columbia, Mass.*—September 8, 9.—Frost in the morning.

*Newbury, Mass.*—September 8.—Quite a frost; only a few vine leaves were killed here; but a few miles distant some cornfields were whitened.

*Colebrook, Conn.*—September 8.—Slight frost.

*Palmyra, N. Y.*—September 30.—No frost yet.

*Clinton, N. Y.*—September 7.—First frost, very slight; only in the valley. 17th, rather a severe frost this morning, but not sufficient to injure vegetation.

*Rochester, N. Y.*—September 17.—Slight frost; killed cucumbers out of the city; little damage.

*Gouverneur, N. Y.*—September 17, 27.—Slight frost.

*Nichols, N. Y.*—September 16.—Frost on boards and fences.

*South Trenton, N. Y.*—September 20.—Very light frost this morning; 25th, frost barely visible; clipped pumpkin vines lightly. 30th, light frost.

*South Hartford, N. Y.*—No frost sufficient to injure vegetation during the month; on the morning a slight frost was noticed in very exposed localities. We usually have frost about the 20th of September.

*Palermo, N. Y.*—September 17.—A slight frost this morning; not enough to kill tender vegetation.

*Theresa, N. Y.*—September 17.—Light frost. 26th, a hard frost, though no white frost seen till after sunrise.

*Progress, N. J.*—September 30.—No frost yet.

*Haddonfield, N. J.*—No frost occurred during the month; on the morning of the 20th the mercury sank to 44°, and on the 26th to 42°.

*Fleming, Penn.*—September 1.—A light frost this morning, no damage done; 20th, frost this morning, not much damage done to vegetables.

*Grampian Hills, Penn.*—September 1.—Light frost; no damage done.

*Hillsborough, Ohio.*—September 25.—It is said there was some frost.

*Urbana, Ohio.*—September 13.—Frost; could perceive no damage to the most tender plant, although beards were white with the frost. 19th, white frost; no injury to vegetation.

*Kingston, Ohio.*—September 13.—Frost this morning on fences, &c.

*Bethel, Ohio.*—September 25.—Very light frost just perceptible.

*New Lisbon, Ohio.*—September 1.—Light frost; no damage.

*Pontiac, Michigan.*—September 13.—Frost, injuring corn, vines, potatoes, and tobacco on low lands. 25th, frost on low lands.

*Newcastle, Indiana.*—September 19.—Light frost, the first since June; no injury. 24th, pretty heavy frost.

*Spiceland, Indiana.*—September 25.—Considerable frost.

*Indianapolis, Indiana.*—September 19 and 25.—Slight frost on these mornings but not sufficient to do any damage worth naming. These were the first frosts of the season.

*Rensselaer, Indiana.*—September 19.—Heavy white frost in the morning which nipped vines, beans, tomatoes, &c., and the blades of corn and sorghum, but did no material injury except to buckwheat. 25th and 30th, white frost in the morning.

*Hoylton, Illinois.*—September 19.—Light frost last night.

*Wyanet, Illinois.*—September 19.—Heavy frost this morning; 24th, 25th little frost on low lands.

*Hazel Dell, Illinois.*—The first frosts of the season were on the 19th and 25th; but neither time sufficient to kill the most tender plant, except in very exposed situations.

*Waverley, Illinois.*—September 19.—First frost of the season, but not enough to do any injury.

*Ottawa, Illinois.*—September 18.—Slight frost, the first of the season.

*Elmore, Illinois.*—September 19.—Frost this morning, killed the tomato, cucumber and potato vines; injured the blades of the corn.

*Winnebago, Illinois.*—September 19.—Frost this morning.

*Allenton, Missouri.*—September 19.—Frost, barely observable on my premises, but injuring tobacco plants, cucumber and watermelon vines in a neighbor's adjacent field. 25th, white frost in a neighboring tobacco field.

*Euston, Missouri.*—September 18.—First frost of the season.

*Canton, Missouri.*—September 19.—First frost; ice formed; thermometer  $31^{\circ}$  at 5.30 a. m.; vines, corn, sorghum, &c., killed on low ground; no damage done on the uplands. 24th, light frost.

*Waupaca, Wisconsin.*—September 19.—Slight frost, first of the season; thermometer at 4 a. m.  $38^{\circ}$ . 25th, heavy frost.

*Embarrass, Wisconsin.*—September 19.—Very hard frost this morning; killed late squashes, &c. 20th, light frost. 24th, hard frost this morning. 25th, very hard frost.

*Green Bay, Wisconsin.*—September 19.—First frost. 25th, frost this morning; ice an eighth of an inch thick.

*Milwaukee, Wisconsin.*—September 19.—Frost this morning.

*Delavan, Wisconsin.*—September 19.—First frost; thermometer at 6.30 a. m.  $34^{\circ}$ .

*Manitowoc, Wisconsin.*—September 19.—Frost in some places back from the lake shore. 25th, cucumbers, beans, potatoes, and leaves of grape vines frozen.

*Beaver Bay, Minnesota.*—September 24, 25.—First frost; partly killed the leaves of cucumbers, tomatoes, and potatoes. 28th, frost.

*New Ulm, Minnesota.*—September 19.—First frost; damaged some garden



vegetables in the bottoms. 28th, in the morning found water in a pail frozen over with ice an eighth of an inch thick; thermometer  $32^{\circ}$  at 7 a. m.

*St. Paul, Minnesota.*—September 19.—First frost, high grounds generally escaping.

*Fort Madison, Iowa.*—September 19, 24.—First frosts; vegetation unhurt.

*Independence, Iowa.*—September 8.—Light frost, but it did no damage. 19th, frost killed the vines and the leaves on some of the trees, so that they commenced to fall, but did no damage to the sugar cane.—(*Deering.*)

*Independence, Iowa.*—September 19.—Very severe frost; ice a quarter of an inch thick at 7 a. m. 24th, heavy frost this morning.—(*Wheaton.*)

*Iowa Falls, Iowa.*—Thermometer  $32^{\circ}$  at sunrise on the 19th, 20th, 24th, 27th, and 28th.

*Monticello, Iowa.*—September 19.—First frost; it came too late to do any damage to crops, except perhaps some late pieces of sugar cane.

*Waterloo, Iowa.*—September 19.—Heavy frost; vegetation effectually checked. 20th, 22d, some frost.

*Lyons, Iowa.*—September 19.—White frost covering the ground, but doing little injury. 24th, frost, not very severe; the frosts were light, and did no injury, because all things are out of the way of frost.

*Guttenberg, Iowa.*—September 19, 20.—White frost on both these mornings. 24th, thermometer  $40^{\circ}$  at sunrise; no white frost. 28th, thermometer at sunrise  $37^{\circ}$ , a slight frost; ice formed less than a tenth of an inch thick on water in a tub.

*Algeria, Iowa.*—September 18.—Heavy frost. 24th, ice a quarter of an inch thick.

*Iowa City, Iowa.*—September 19.—First frost; it was confined to low places, and did little or no damage.

*Dubuque, Iowa.*—September 18, 19.—Light frost on both these mornings.

*Onawa, Iowa.*—September 18.—First frost of the season, very light. 24th, first hard frost; no further frost during the month.

*Fort Riley, Kansas.*—September 28.—Rain with large flakes of snow for about eight minutes, commencing at 8 a. m.

*Richland, Nebraska.*—September 18.—A little white frost in ravines; heavy white frost in Papillon and Bell creek and vicinities. 24th, heavy white frost



